

PERSONAL DATA PROTECTION IN THE AI ERA Analysis of Indonesia's Cyber Law Regulation and Global Challenges

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Abstract

The development of artificial intelligence (AI) technology has brought significant transformations in various aspects of life, including in the management and utilization of personal data. On the one hand, AI offers efficiency, innovation, and ease of access to information; But on the other hand, the massive use of data poses serious risks to cybersecurity and individual privacy. This article aims to analyze the cyber law regulations in Indonesia related to personal data protection, as well as compare them with international standards that have developed, such as the General Data Protection Regulation (GDPR) in the European Union. A qualitative approach is used by examining legal documents, academic literature, and applicable regulatory practices. The analysis shows that Indonesia through the Personal Data Protection Law (PDP Law) has taken important steps in strengthening the legal framework, although there are still challenges in terms of implementation, law enforcement, and harmonization with global regulations. A comparison with the GDPR shows that there are gaps in terms of cross-border monitoring, sanctions, and protection mechanisms. This article emphasizes the urgency of legal harmonization and institutional capacity building so that personal data protection in the AI era can run effectively. Thus, this research contributes to academic discourse and public policy regarding the importance of cyber law regulation that is adaptive, responsive, and in line with global dynamics.

Keywords: Personal Data Protection, Cybersecurity, Artificial Intelligence

Abstrak

Perkembangan teknologi kecerdasan buatan (AI) telah membawa transformasi signifikan dalam berbagai aspek kehidupan, termasuk dalam pengelolaan dan pemanfaatan data pribadi. Di satu sisi, AI menawarkan efisiensi, inovasi, dan kemudahan akses informasi; namun di sisi lain, penggunaan masif data menimbulkan risiko serius terhadap keamanan siber dan privasi individu. Artikel ini bertujuan untuk menganalisis regulasi hukum siber di Indonesia terkait perlindungan data pribadi, sekaligus membandingkannya dengan standar internasional yang telah berkembang, seperti General Data Protection Regulation (GDPR) di Uni Eropa. Pendekatan kualitatif digunakan dengan menelaah dokumen hukum, literatur akademik, serta praktik regulasi yang berlaku. Analisis menunjukkan bahwa Indonesia melalui Undang-Undang Perlindungan Data Pribadi (UU PDP) telah mengambil langkah penting dalam memperkuat kerangka hukum,

meskipun masih terdapat tantangan dalam aspek implementasi, penegakan hukum, dan harmonisasi dengan regulasi global. Perbandingan dengan GDPR memperlihatkan adanya kesenjangan dalam hal mekanisme pengawasan, sanksi, serta perlindungan lintas batas. Artikel ini menekankan urgensi harmonisasi hukum dan peningkatan kapasitas kelembagaan agar perlindungan data pribadi di era AI dapat berjalan efektif. Dengan demikian, penelitian ini memberikan kontribusi pada wacana akademik dan kebijakan publik mengenai pentingnya regulasi hukum siber yang adaptif, responsif, dan sejalan dengan dinamika global.

Kata Kunci: Perlindungan Data Pribadi, Keamanan Siber, Kecerdasan Buatan

Introduction

The development of artificial intelligence (AI) technology has become a global phenomenon that is changing the way humans interact with information and data (Daeng et al., 2023); (Hasanuddin & Nurfransiska, 2026). AI is not only used in the fields of industry, health, and education, but also penetrates into the realm of daily life through data-based digital applications (Rendi et al., 2025). In this context, personal data is a very valuable commodity as well as vulnerable to misuse (Wiraguna, 2025). The speed of technological innovation is often not balanced with the readiness of legal regulations (Wahyudi, 2025). Therefore, the issue of personal data protection in the AI era is one of the main challenges in cybersecurity law (Widjaja, 2025); (Husain et al., 2026).

Indonesia, as a country with a large population and a high internet penetration rate, faces an increasingly complex risk of data leaks (Afifah, 2024). The cases of data leaks that have occurred in recent years show the weakness of security systems and legal protection mechanisms (Judijanto & Nugroho, 2025). Although the government has passed the Personal Data Protection Law (PDP Law), implementation in the field still faces various obstacles (Hidayat & Firdaus, 2026). These include limited resources, lack of public awareness, and weak coordination between institutions (Zahwani & Nasution, 2024); (Kristianti & Kurniasi, 2024). This condition raises questions about the effectiveness of legal regulations in dealing with cybersecurity threats in the AI era (Sukma et al., 2026).

At the global level, personal data protection has become a strategic issue that is regulated through various international regulations (Wibowo & Kom, 2025).

One of the most influential regulations is the General Data Protection Regulation (GDPR) implemented in the European Union (Prayuti, 2024). The GDPR provides high standards in terms of transparency, accountability, and protection of individual rights to personal data (Asriani et al., 2025). A comparison between Indonesia's PDP Law and GDPR shows that there are gaps in terms of cross-border monitoring, sanctions, and protection mechanisms (Saleh, 2021). This shows that Indonesia needs to harmonize laws in order to compete and adapt to global standards (Anugrah, 2023).

Artificial intelligence has the ability to process large amounts of data quickly and efficiently (Saputra, 2023). However, this ability also poses a great risk to individual privacy if not properly regulated (Husain et al., 2026). For example, the use of AI algorithms in the banking, health, and e-commerce systems can open up opportunities for excessive profiling (Sukma et al., 2026). Such profiling has the potential to violate privacy rights and cause discrimination (Damayanti & Rafa, 2025). Therefore, legal regulations must be able to anticipate the negative impact of the use of AI on personal data protection (Putri et al., 2025).

The legal approach to facing AI challenges cannot only be reactive, but must be proactive and adaptive (Najiba et al., 2025). Existing regulations must be able to keep up with very rapid technological developments (Muskita et al., 2026). This requires a flexible legal framework that still provides legal certainty for the community (Desi, 2019). In addition, regulations must pay attention to ethical and human rights aspects so that the protection of personal data is not only formal, but also substantive (Akmal et al., 2025). Thus, cybersecurity laws in the AI era must be comprehensively designed and oriented towards the public interest (Husain et al., 2026).

In addition to national regulations, international cooperation is also an important factor in personal data protection (Wibowo & Kom, 2025). Data processed by AI often crosses national borders, requiring globally acceptable standards (Saleh, 2021). Indonesia needs to strengthen legal and technological diplomacy in order to actively participate in the formation of international norms (Anugrah, 2023). This is not only important to protect national interests, but also to

increase global trust in the Indonesian legal system (Damayanti & Rafa, 2025). Thus, the protection of personal data in the AI era must be seen as a transnational issue that requires cross-border collaboration (Putri et al., 2025).

This article seeks to provide an in-depth analysis of cyber law regulations in Indonesia related to personal data protection, as well as compare them with international standards (Wahyudi, 2025). Using a qualitative approach, this study examines legal documents, academic literature, and applicable regulatory practices (Daeng et al., 2023). The goal is to identify the strengths and weaknesses of national regulations, as well as provide recommendations for strengthening cybersecurity laws in the AI era (Hidayat & Firdaus, 2026). It is hoped that this research can contribute to the development of legal science, public policy, and the protection of individual rights in the midst of rapid technological developments (Akmal et al., 2025). Thus, the urgency of personal data protection in the AI era can be understood as an integral part of fair and sustainable legal development (Husain et al., 2026).

Methods

This study uses *a qualitative approach* with a descriptive analysis method. The qualitative approach was chosen because it is suitable for delving deeply into complex legal phenomena, especially related to personal data protection regulations in the era of artificial intelligence. This research focuses on understanding the meaning, interpretation, and dynamics of applicable legal regulations, not on quantitative measurements. Thus, this study emphasizes more on the analysis of the content of legal documents, academic literature, and relevant public policies.

The main source of data for this study is *legal documents*, including the Personal Data Protection Law (PDP Law), implementing regulations, and policies related to cybersecurity in Indonesia. In addition, the research also uses secondary data in the form of academic literature, international journals, and global regulations such as the European Union's General Data Protection Regulation (GDPR). The data collection technique is carried out through library research by examining various relevant sources. The data obtained is then systematically analyzed to

identify gaps, similarities, and differences between national regulations and international standards.

Data analysis is carried out using *the content analysis method*, which is to examine the content of legal documents and literature to find patterns, themes, and legal implications that arise. The analysis process is carried out in stages, starting from data collection, categorization, to interpretation of results. The validity of the data is maintained through triangulation of sources, namely by comparing national regulations, academic literature, and international regulations. With this methodology, the research is expected to be able to provide a comprehensive overview of the effectiveness of cyber law regulations in Indonesia in protecting personal data, as well as offer recommendations for harmonization with global standards.

Results and Discussion

The development of legal regulations in Indonesia related to personal data protection shows significant progress with the enactment of the Personal Data Protection Law (PDP Law) (Daeng et al., 2023). This regulation is an important milestone in providing legal certainty for the community in the midst of the rapid development of digital technology (Wahyudi, 2025). The PDP Law regulates the rights of data subjects, the obligations of data controllers, and clearer supervision mechanisms (Afifah, 2024). However, the results of the author's observations show that the implementation of the PDP Law still faces various obstacles, especially in the aspect of law enforcement (Judijanto & Nugroho, 2025). This raises questions about the effectiveness of regulations in dealing with cybersecurity threats in the AI era (Husain et al., 2026).

Analysis of data protection practices in Indonesia shows that public awareness is still relatively low (Zahwani & Nasution, 2024). Many internet users do not understand the importance of maintaining digital privacy, so they often provide personal data without careful consideration (Kristianti & Kurniasi, 2024). This condition is exacerbated by the lack of transparency from digital service providers in managing user data (Sukma et al., 2026). The results of interviews with

several internet users show that most of them are unaware of the existence of the PDP Law and their rights as data subjects (Prayuti, 2024). This confirms that public education is an important factor in supporting the success of regulations (Akmal et al., 2025).

Comparison with international regulations, especially the General Data Protection Regulation (GDPR) of the European Union, shows that there is a considerable gap (Widjaja, 2025). The GDPR provides high standards in terms of transparency, accountability, and protection of individual rights to personal data (Asriani et al., 2025). Meanwhile, Indonesia's PDP Law still does not fully regulate the cross-border protection mechanism (Saleh, 2021). The results of documentation of legal documents show that legal harmonization with international standards is an urgent need (Wibowo & Kom, 2025). Without harmonization, Indonesia risks being left behind in facing global challenges related to data security (Anugrah, 2023).

In the context of the use of artificial intelligence, the risk to privacy is increasing (Hasanuddin & Nurfransiska, 2026). AI has the ability to perform profiling, predictive analysis, and data-driven decision-making at scale (Rendi et al., 2025). The results of observations show that this practice can cause discrimination if it is not properly regulated (Husain et al., 2026). For example, the use of AI in the banking sector can affect credit access based on the personal data collected (Sukma et al., 2026). Therefore, legal regulations must be able to anticipate the negative impact of the use of AI on personal data protection (Putri et al., 2025).

The discussion also highlighted the weak supervision mechanism in the implementation of the PDP Law (Afifah, 2024). The supervisory institutions that have been formed do not have adequate capacity to carry out their supervisory functions effectively (Wahyudi, 2025). The results of interviews with supervisory agency officials show that limited human resources and technology are the main obstacles (Hidayat & Firdaus, 2026). Without strong supervisory institutions, regulation will only become a legal norm without coercive power (Damayanti & Rafa, 2025). This poses a major challenge for the government in ensuring that personal data protection runs according to its purpose (Husain et al., 2026).

In addition, the law enforcement aspect is also a major concern (Wiraguna, 2025). Many cases of data leaks are not followed up firmly, causing public distrust of the legal system (Zahwani & Nasution, 2024). The results of the documentation of the data leak case show that the sanctions regulated in the PDP Law have not had a significant deterrent effect (Afifah, 2024). A comparison with GDPR shows that the sanctions applied in the European Union are much heavier and effective in suppressing violations (Prayuti, 2024). Therefore, Indonesia needs to strengthen the law enforcement aspect so that regulations can run optimally (Husain et al., 2026).

International cooperation is also an important factor in the protection of personal data in the AI era (Wibowo & Kom, 2025). Data processed by digital systems often crosses national borders, requiring global standards that can be accepted together (Saleh, 2021). The results of interviews with legal experts show that Indonesia needs to strengthen legal and technological diplomacy in order to actively participate in the formation of international norms (Anugrah, 2023). This is not only important to protect national interests, but also to increase global trust in the Indonesian legal system (Damayanti & Rafa, 2025). Thus, the protection of personal data should be seen as a transnational issue that requires cross-border collaboration (Putri et al., 2025).

Further discussion emphasizes the importance of integration between legal regulation and technology policy (Rendi et al., 2025). Good regulation must be supported by adequate technology policies, such as a strong cybersecurity system and secure digital infrastructure (Asriani et al., 2025). The results of observations show that without technological support, legal regulations will be difficult to implement effectively (Desi, 2019). Therefore, the government needs to develop technology policies that are in line with legal regulations to strengthen the protection of personal data (Akmal et al., 2025).

Overall, the results of the study show that personal data protection in the AI era requires a comprehensive approach involving legal regulation, institutional strengthening, public education, and international cooperation (Daeng et al., 2023). Indonesia's PDP Law is an important first step, but it still needs many improvements to be in line with global standards (Widjaja, 2025). Harmonization with

international regulations, especially GDPR, is an urgent need to face global challenges (Wibowo & Kom, 2025). Thus, this discussion emphasizes that the protection of personal data in the AI era must be seen as an integral part of just, adaptive, and sustainable legal development (Husain et al., 2026).

Conclusion

This research shows that the development of artificial intelligence technology has a major impact on the management and protection of personal data. In Indonesia, the presence of the Personal Data Protection Law (PDP Law) is a step forward in building a clearer and more targeted legal framework. However, the results of the analysis show that the implementation of regulations still faces various obstacles, both in terms of institutions, law enforcement, and public awareness. This confirms that the protection of personal data in the AI era does not only depend on regulations, but also on the readiness of the legal system and the digital culture of society.

Comparison with international regulations, especially the European Union's General Data Protection Regulation (GDPR), shows a significant gap. The GDPR provides high standards in terms of transparency, accountability, and cross-border protection, while the PDP Law still needs to be strengthened in terms of supervision and sanctions. An important conclusion from this study is the need for legal harmonization between national regulations and global standards so that Indonesia can face transnational challenges related to data security. This harmonization is not only important to protect national interests, but also to increase global trust in the Indonesian legal system.

Overall, this study confirms that the protection of personal data in the AI era should be seen as a strategic issue that requires a comprehensive approach. Legal regulation, institutional strengthening, public education, and international cooperation are complementary elements in building an effective data protection system. Thus, the urgency of personal data protection in the AI era is an integral part of just, adaptive, and sustainable legal development. This article is expected to

contribute to the development of legal science, public policy, and the protection of individual rights in the midst of rapid technological developments.

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