Digital Privacy and Personal Data Protection in Southeast Asia: Challenges and Efforts toward Legal Harmonization

Yana Chaeru Taufik Ismail[1], Arwansyah bin Kirin[2]

[1]Institut Nahdlatul Ulama (INU) Tasikmalaya, Indonesia
[2]Universiti Tun Hussein Onn Malaysia

Corresponding Author Email: yanachaerutaufikismael@gmail.com

How to Cite:
Ismail, Y. C. T., & bin Kirin, A. (2025). Digital privacy and personal data protection in Southeast Asia: Challenges and efforts toward legal harmonization. *Justitia Nova: Indonesian Journal of Modern Law*, *1*(1), 24–34. https://doi.org/xxx

Abstract

This article explores the evolving landscape of digital privacy and personal data protection in Southeast Asia, a region experiencing rapid digital transformation yet facing significant legal challenges. The study identifies key obstacles including fragmented legal frameworks, inconsistent enforcement, and the lack of harmonized regulations among Southeast Asian countries. By examining recent legislative developments and international influences, the article highlights the complexity of safeguarding personal data while promoting technological innovation and cross-border data flows. It also discusses efforts toward legal harmonization through regional cooperation mechanisms, such as ASEAN initiatives and alignment with global data protection standards like the GDPR. The article argues that effective protection of digital privacy requires an integrated approach balancing economic growth, individual rights, and cultural diversity. The findings emphasize the need for stronger collaboration among policymakers, regulators, and stakeholders to develop cohesive legal frameworks that address emerging privacy risks and build public trust in digital services. This study contributes to the discourse on modern legal governance by providing a comprehensive overview of the current challenges and potential pathways for harmonizing data protection laws in Southeast Asia. The insights offered can assist legislators and practitioners in crafting policies that uphold digital rights while fostering sustainable digital economies in the region.

Keywords:
Digital Privacy, Personal Data Protection, Legal Harmonization, Southeast Asia, Data Governance

1. Introduction

Digital transformation has become an essential driver of change across South and Southeast Asia. From precision healthcare to mobile finance, technology is reshaping core sectors—even in low- and middle-income countries. For instance (Yi et al., 2024), highlight how digital health innovations hold promise in these contexts despite constraints such as limited infrastructure, workforce shortages, and systemic inefficiencies. Their study underscores a critical tension: while technology can extend access, it also raises issues regarding data privacy, user trust, and

governance frameworks that are not yet fully matured in these emerging environments. The financial sector reveals a similar paradox. Mobile wallets, online banking platforms, and fintech innovations have revolutionized access to financial services, notably improving inclusion across Southeast Asia. Nabil Adel demonstrates that digital literacy and technology adoption significantly enhance financial inclusion in Asia, Africa, and Latin America (Adel, 2024). However, he indicates that weak data protection frameworks hamper full user confidence. In many Southeast Asian countries, legal regulations have not kept pace with technological innovations, leaving a gap in user safety. Fathur Rahman Prawira further shows a strong correlation between user trust, information security, and the continued adoption of e-wallets. His findings suggest that without robust privacy safeguards, digital financial platforms may struggle to maintain user engagement and growth (Prawira et al., 2024).

Within the business domain, small and medium enterprises (SMEs) in Thailand, as explored by (Chatsuwan et al., 2023), illustrate another dimension of this challenge. Using a privacy policy scoring framework, they find that most SMEs fail to meet basic standards for personal data protection. This points to a regional trend: digital innovation outpaces the ability of local regulatory bodies and businesses to ensure proper data governance. The application of digital technologies extends beyond finance and health. Fei Li and colleagues, in their synthesis of AI and remote sensing for urban sustainability, note an increased reliance on remote data collection without adequate safeguards for personal data protection (Li et al., 2023). This reflects a broader global challenge: advanced technologies can enhance public welfare but may unintentionally infringe on individual privacy rights.

Digital spaces also pose rising risks from cybercrime—a concern reinforced by (Alhadidi et al., 2024) research among Jordanian university students. He notes a direct link between legal awareness and digital safe practices. These findings speak to a widespread need in Southeast Asia for improved legal literacy and proactive regulatory enforcement if digital transformation is to be both inclusive and secure. Given this patchwork of sectoral studies, a significant gap remains: there is no comprehensive analysis of digital privacy and personal data protection across Southeast Asia's national legal systems, nor a synthesis of harmonization efforts at the regional level (Ahyani et al., 2025). The existing literature offers pieces of the puzzle—a smartphone health app in Indonesia, a mobile money initiative in Malaysia, or an SME policy audit in Thailand—but lacks an integrated regional perspective. This is problematic in an era of rapid digital convergence. As technologies transcend borders, data governance frameworks must likewise become interoperable. Without regional alignment, consumers remain vulnerable to cross-border data misuse, and digital innovation may stall due to citizen mistrust.

This study aims to bridge this gap by analyzing how Southeast Asian nations, individually and collectively, approach digital privacy and personal data protection. It will first map the current legal frameworks across key countries in the region, examining whether there is consistency in definitions, principles, and enforcement mechanisms. Governments in the region—Indonesia, Malaysia, Thailand, Singapore, and the Philippines—vary in their legislative maturity, but share similar challenges in enforcement and citizen awareness. Second, the research will assess regulatory compliance through case studies in financial and health sectors, drawing on existing

survey data, public filings, and secondary reports. For example, it will review how banks, fintech platforms, hospitals, and digital health apps operationalize consent, data minimization, breach notification, and legal redress. This sector-based lens allows for a grounded understanding of the everyday implications of privacy laws. Third, the study will evaluate regional harmonization efforts—especially within ASEAN—and their alignment with global standards such as the European Union's GDPR. While ASEAN's Digital Data Framework and the Declaration on Cyber Norms signal political will, gaps remain in binding implementation. This paper will analyze whether existing mutual recognition arrangements or capacity-building programs support cross-border interoperability.

Ultimately, this research seeks to provide a cohesive roadmap for harmonizing data protection regimes in Southeast Asia. By comparing legal instruments, enforcement outcomes, and regional policy initiatives, the study hopes to offer actionable recommendations for policymakers and stakeholders. These include proposals for minimum regional standards, coordinated compliance audits, public-private partnerships in digital education, and a Southeast Asia data literacy campaign to foster public trust. Through this comprehensive analysis, the study aims to contribute to the discourse on sound legal governance in the digital age, inform policy design, and strengthen the legal infrastructure needed for secure, equitable, and responsible digital economies across Southeast Asia.

2. Literature Review

The rapid acceleration of digital technology across Southeast Asia has raised profound questions regarding the adequacy of legal protections—particularly for personal data and digital privacy. In the healthcare sector, Siyan Yi et al. (2024) investigated how digital health innovations such as telemedicine, mobile health (mHealth), and digital diagnostics are shaping low- and middle-income countries (LMICs) in South and Southeast Asia. Their study highlighted the dual reality of these innovations: on one hand, they increase accessibility and efficiency in healthcare delivery, but on the other hand, they introduce vulnerabilities, especially in environments with weak or underdeveloped legal and regulatory frameworks. The absence of consistent privacy safeguards across jurisdictions leaves room for ethical breaches and exploitation, especially of sensitive health data.

In the realm of financial inclusion, Adel (2024) examined the influence of digital literacy and technological adoption across Africa, Asia, and Latin America. His findings indicate that technology enhances access to financial services but simultaneously exposes consumers to risks due to legal underdevelopment. He stresses that inadequate legal instruments for consumer protection and data privacy dilute the benefits of financial inclusion. Complementary to this, Fathur Rahman Prawira (2024) found that users' continued use of e-wallets is highly dependent on perceived information security and the existence of enforceable privacy protections. Both studies confirm that legal trust is central to sustained digital engagement, yet such trust remains fragile without robust regulatory support. Expanding on data governance at the enterprise level, (Chatsuwan et al., 2023) conducted an empirical privacy policy assessment among small and medium-sized enterprises (SMEs) in Thailand. Their research revealed that most SMEs fall short of compliance with personal data protection standards, especially concerning user

consent, data sharing transparency, and breach notification protocols. This non-compliance stems not only from a lack of legal enforcement but also from poor understanding of data protection principles. These findings emphasize the urgent need for harmonized legal tools and education to support businesses in aligning with global privacy standards. Meanwhile, Li et al. (2023) examined the application of AI and remote sensing in sustainable urban development, primarily focusing on technological capabilities. While their framework is valuable in promoting smart city planning, it underplays the regulatory void in personal data protections that accompany such data-intensive systems. The study underscores a pattern repeated in many developing contexts—technological innovation often outpaces the evolution of legal structures. In a more behavior-centric study, (Alhadidi et al., 2024) explored the influence of cybercrime awareness on student behavior in Jordan. His findings show a direct correlation between legal awareness and safe online behavior, suggesting that effective privacy protection also hinges on the legal literacy of digital users. This draws attention to the need for comprehensive strategies that not only enforce data protection laws but also embed them within educational and institutional systems.

While these regional studies highlight critical issues, they tend to be sectoral and fragmented, lacking a cohesive effort to integrate data privacy laws across borders. In contrast, a number of global efforts offer insight into how harmonization may be approached. For instance, (Reddy, 2025) tackled the harmonization of regulations for AI-enabled software as a medical device. His work outlines the complexity of aligning definitions, certifications, and evaluation metrics across different jurisdictions—a challenge familiar to Southeast Asian regulators dealing with cross-border data flow. Similarly, (Sacconi et al., 2025) focused on harmonizing myasthenia gravis patient registries in Europe and developing interoperable digital health platforms. This initiative shows the importance of standardization and collaborative frameworks, which remain largely undeveloped in Southeast Asia. Choi, in his report on the Asian National Control Laboratory Network, emphasized the need for coordinated regulatory frameworks to facilitate cross-border plasma transfer. While the domain is biomedical, the regulatory logic—trust, standardization, and mutual recognition—is directly transferable to digital privacy governance (Choi et al., 2025). In pharmaceutical regulation, (Feng et al., 2024) proposed the establishment of an ASEAN-wide medicines agency to address legal fragmentation. Her proposal mirrors ongoing calls for a Southeast Asian data protection authority to oversee harmonization of digital privacy laws. (Bittisnich, 2024) analyzed the harmonization of food safety regulations in global trade, illustrating how non-uniform legal systems create technical barriers and trust deficits. Lastly, (Kovatch et al., 2025) proposed guidelines for globally harmonizing ethical methods in scientific research, underlining the tension between local norms and international expectations—an issue also central to privacy law. The comparative insights from these global and regional studies are summarized in the following table:

Table 1: Comparison of Previous Studies on Digital Privacy and Legal Harmonization in Southeast Asia

Author and Focus	Domain	Harmonization Objective	Key Challenges	Relevance to Digital Privacy
Siyan Yi et al. (2024)	Digital Health	Ethical data usage and system integration	Weak legal infrastructure in LMICs	High – health data sensitivity
Adel (2024)	Financial Technology	Equitable digital access	Trust gaps due to legal inadequacy	Medium – e-finance risks

Author and Focus	Domain	Harmonization Objective	Key Challenges	Relevance to Digital Privacy
Chatsuwan et al. (2023)	SME Privacy Compliance	Privacy policy enforcement	Low literacy and regulation enforcement	High – SME compliance issues
Reddy (2025)	AI in Healthcare	Certification and regulatory convergence	Differing legal definitions	High – AI data classification
Sacconi (2025)	Health Data Registries	Interoperability and registry standards	Lack of technical and legal alignment	High – digital health systems
Choi (2025)	Plasma Transfer Regulations	Regional legal coordination	Infrastructure and regulatory gaps	Medium – mirrors data flow
Feng (2024)	ASEAN Pharmaceutical Law	ASEAN-wide regulatory agency	Political will and sovereignty issues	High – applicable framework
Bittisnich (2024)	Global Food Safety	Trade standardization	Technical legal inconsistencies	Medium – shows trust barriers
Kovatch (2025)	Scientific Ethics	Global ethical method alignment	Recognition of alternative approaches	Medium – ethical alignment

From the table above, it is clear that although the domains vary—ranging from digital finance to AI medical software and trade safety—there are recurring similarities in regulatory fragmentation, lack of legal standardization, and enforcement inconsistencies. Studies such as those by Reddy, Feng, and Sacconi point to structured harmonization strategies, whereas Southeast Asian research tends to focus on descriptive analyses of current vulnerabilities. This discrepancy presents a clear research gap: while Southeast Asia is actively deploying digital technologies, its legal systems lag behind in providing harmonized, enforceable, and cross-border privacy protection. The absence of comparative and harmonization-focused legal studies leaves a void in both academic discourse and policy-making. Thus, this study seeks to fill that gap by proposing a strategic roadmap toward the harmonization of digital privacy and personal data protection laws in Southeast Asia, drawing from successful global models and regional realities.

3. Methodology

This research employs a qualitative normative legal research approach, with a focus on doctrinal analysis and comparative legal methods (AllahRakha, 2024). The study aims to examine and analyze the challenges of digital privacy and personal data protection laws across Southeast Asian countries, as well as the regional and international efforts to harmonize these laws. The core objective is to understand the legal diversity in data protection frameworks and to explore opportunities for convergence through harmonization efforts within the ASEAN region and beyond. The doctrinal method allows for in-depth exploration of primary legal sources such as national constitutions, statutory laws, regulations, and judicial decisions, as well as regional frameworks, including the ASEAN Framework on Personal Data Protection, and international standards such as the OECD Privacy Guidelines, EU General Data Protection Regulation (GDPR), and APEC Privacy Framework. Secondary sources such as journal articles, policy papers, official reports, and legal commentaries are also used to support the interpretation and contextual understanding of these legal texts (Mustofa et al., 2024).

This study selects five representative countries in Southeast Asia—Indonesia, Malaysia, Thailand, the Philippines, and Singapore—as case studies. These countries were chosen due to the varying levels of digital infrastructure, economic development, and legal maturity in their data protection regimes. By comparing these jurisdictions, the research highlights not only the

common challenges faced in regulating digital privacy but also the divergent legal responses rooted in each country's legal tradition and policy orientation (Ahyani et al., 2022). To assess harmonization efforts, the study uses a comparative legal analysis to map the similarities and differences among the selected countries' data privacy frameworks. This includes comparing definitions of personal data, legal bases for processing, consent mechanisms, data subject rights, cross-border data transfer rules, and enforcement mechanisms. The study also investigates whether these frameworks reflect global privacy principles such as transparency, accountability, proportionality, and data minimization.

Furthermore, the study incorporates content analysis of relevant policy documents, official government statements, and regulatory guidelines from ASEAN forums, national data protection authorities, and international organizations. The aim is to identify the political, economic, and institutional factors that influence the pace and direction of legal harmonization in the region. In addressing the research problem, the methodology also considers the socio-legal dimension of data privacy, recognizing that legal norms do not operate in isolation but are shaped by social, technological, and economic realities. Therefore, particular attention is given to the impact of digital transformation, cybersecurity threats, and cross-border data flows on the enforcement of privacy rights in Southeast Asia (Anand et al., 2024). Where available, empirical findings from previous studies—such as digital literacy rates, public trust in institutions, and the effectiveness of enforcement bodies—are incorporated to enrich the legal analysis. This research does not employ fieldwork or direct interviews, but relies on desk-based research from reputable academic databases, international legal repositories, ASEAN publications, and government websites. All sources are selected based on credibility, relevance, and timeliness to ensure the validity of the research findings. Lastly, the research acknowledges its limitations, including the evolving nature of digital privacy law and the uneven availability of translated legal texts from Southeast Asian jurisdictions. Nevertheless, by adopting a comparative, doctrinal, and policy-oriented lens, this study aims to contribute meaningful insights into the future trajectory of digital privacy protection and legal harmonization in Southeast Asia.

4. Results and Discussion
4.1. Result

This study reveals several key findings regarding the state of digital privacy and personal data protection in Southeast Asia and the progress toward legal harmonization. Firstly, the legal frameworks across the selected countries — Indonesia, Malaysia, Thailand, the Philippines, and Singapore — exhibit both convergence and divergence. All countries have adopted data protection laws in some form, but the scope and enforcement vary considerably. For example, Singapore's Personal Data Protection Act (PDPA) is widely regarded as mature and comprehensive, with clear provisions on consent, data subject rights, and cross-border data transfers. Malaysia and the Philippines also have established data protection laws, but their implementation and enforcement mechanisms are still developing. Indonesia and Thailand, while having legal provisions, show gaps in regulation coverage and enforcement consistency. Secondly, the definitions of personal data and sensitive personal data differ among jurisdictions, leading to potential conflicts in regional data handling. For instance, some countries explicitly

include biometric and health data as sensitive personal data, while others lack clear definitions, creating ambiguity for data controllers and processors. Thirdly, the legal bases for data processing diverge significantly. While consent remains the predominant basis, some countries permit processing for legitimate interests or public interest without explicit consent, reflecting variations in balancing privacy with economic or governmental needs.

Cross-border data transfer rules also present significant challenges. Only a few countries have comprehensive provisions regulating international data flows, while others rely on voluntary compliance or lack clear legal frameworks. This inconsistency poses barriers to regional digital trade and cooperation. Fourthly, enforcement mechanisms, including the existence and powers of data protection authorities, vary widely. Singapore and Malaysia have independent authorities with investigatory and sanctioning powers, whereas Indonesia's regulatory body is still evolving. This affects the level of compliance and public trust. Regarding harmonization efforts, ASEAN has made notable progress by issuing the ASEAN Framework on Personal Data Protection, aimed at creating a common standard to facilitate cross-border data flows and promote regional trust. However, the framework remains non-binding and voluntary, which limits its effectiveness. Finally, socio-economic factors such as varying levels of digital literacy, public awareness of privacy rights, and differences in technological infrastructure influence both the implementation of data protection laws and the readiness for harmonization.

4.2 Discussion

The results of this study provide insightful perspectives on the current state and challenges of digital privacy and personal data protection laws in Southeast Asia. The fragmented nature of the regulatory landscape across ASEAN member states underscores the complexity of achieving effective legal harmonization in this domain. The discussion below interprets the key findings, their implications, and situates them within broader scholarly and policy contexts. Firstly, the diversity in legal frameworks highlights that while data protection has become a priority across Southeast Asia, the approaches reflect distinct national priorities, capacities, and socio-political contexts. Countries like Singapore, with its robust and mature regulatory regime, exemplify a model of effective legal infrastructure that balances stringent privacy safeguards with enabling digital innovation. In contrast, nations still in developmental stages of regulation face challenges such as unclear definitions, weak enforcement, and limited public awareness. This disparity suggests that harmonization efforts must be flexible enough to accommodate different starting points while promoting a common baseline standard.

Secondly, the discrepancies in defining personal data and sensitive data reveal the nuanced ways in which privacy is conceptualized. Such differences impact cross-border data flows and complicate compliance for multinational companies operating regionally. This finding aligns with prior research that emphasizes the need for clear, consistent terminology in data protection to reduce legal uncertainty and promote interoperability among different jurisdictions (Feng, 2024; Kovatch, 2025). The absence of universally accepted definitions hampers the creation of seamless digital markets and undermines consumer confidence. Thirdly, the analysis of legal bases for data processing demonstrates contrasting balances between privacy rights and economic development goals. Jurisdictions that allow broader grounds for processing without

explicit consent tend to prioritize business facilitation and government functions over stringent individual control. This reflects broader tensions noted in the literature between privacy as a fundamental right and the practical demands of data-driven economies (Chatsuwan et al., 2023; Yi et al., 2024). Policymakers must navigate these competing interests carefully to foster both innovation and protection.

Furthermore, the issue of cross-border data transfers emerges as a critical barrier to regional integration and digital trade. The voluntary and non-binding nature of ASEAN's framework limits its efficacy, underscoring the need for binding agreements or mutual recognition arrangements to facilitate legal certainty and trust. This echoes global discussions on data sovereignty and digital sovereignty, where national interests often challenge the free flow of data (Feng, 2024; Sacconi, 2025). ASEAN's gradual approach may reflect political realities, but without stronger commitments, the digital economy's potential risks fragmentation.

Enforcement mechanisms and institutional capacity play a pivotal role in ensuring that data protection laws are not merely symbolic. The gap between legislation and enforcement observed in some countries weakens regulatory impact and reduces deterrence against violations. This finding supports previous studies emphasizing that legal harmonization should go hand-in-hand with capacity building for regulatory authorities and public education (Prawira, 2024; Alhadidi, 2024). Without these investments, laws risk becoming nominal without substantive protection for data subjects. Socio-economic factors such as digital literacy and public awareness critically influence the effectiveness of data protection frameworks. Low levels of awareness diminish the ability of individuals to exercise their rights, while inadequate infrastructure can hinder compliance. This aligns with global evidence highlighting the importance of complementing legal measures with education and technical development (Adel, 2024; Li et al., 2023). Consequently, a multi-dimensional strategy that integrates legal reform with capacity building and public engagement is essential.

From a theoretical standpoint, the findings resonate with the concept of regulatory pluralism, where multiple overlapping legal systems coexist and require coordination to function effectively (Bittisnich, 2024). The ASEAN context exemplifies this, with national laws, regional frameworks, and international influences interacting dynamically. This pluralism presents both opportunities and challenges for harmonization efforts. The research also uncovers an important gap in the literature: the limited empirical understanding of how these laws affect actual data subjects and businesses. While legal texts provide a framework, the lived realities of compliance, enforcement, and privacy protection remain underexplored in Southeast Asia. Addressing this gap requires qualitative and quantitative research methodologies to assess effectiveness and identify best practices. In conclusion, the path toward harmonized digital privacy and personal data protection laws in Southeast Asia is complex and incremental. The findings suggest that policymakers should pursue flexible harmonization that respects national contexts while promoting core principles of privacy and data security. Enhanced cooperation among regulators, investment in institutional capacity, and public education are vital to bridging current gaps. This integrated approach will better support the region's digital economy ambitions while safeguarding fundamental rights.

5. Conclusion

This study has explored the challenges and efforts toward the harmonization of digital privacy and personal data protection laws in Southeast Asia. The findings demonstrate that while significant strides have been made in developing national legal frameworks, considerable disparities remain in definitions, enforcement mechanisms, and regulatory capacities across the region. These differences hinder seamless cross-border data flows and pose challenges for businesses and consumers alike. The research highlights that harmonization efforts must balance respect for national sovereignty and diverse socio-economic contexts with the need for common standards that protect individual privacy and foster trust in the digital economy. Key recommendations include enhancing regulatory cooperation, establishing clearer and consistent definitions of personal data, strengthening enforcement institutions, and promoting digital literacy among the public.

Ultimately, achieving effective legal harmonization in digital privacy and data protection will require a multidimensional strategy that integrates legal reforms with capacity building and regional collaboration. This approach will enable Southeast Asian countries to collectively safeguard privacy rights while facilitating innovation and economic growth in an increasingly digitalized world. This study contributes to the existing literature by providing a comparative analysis of Southeast Asia's legal landscape and identifying critical gaps for future research. The novelty lies in its comprehensive examination of both legal and socio-economic factors affecting data protection harmonization, offering practical insights for policymakers, scholars, and practitioners working to bridge regulatory divides in the region.

Acknowledgments

References

Adel, N. (2024). The impact of digital literacy and technology adoption on financial inclusion in Africa, Asia, and Latin America. *Heliyon*, *10*(24), e40951. https://doi.org/10.1016/j.heliyon.2024.e40951

Ahyani, H., Parhan, P., Muhtolib, M., Berizi, A., Nurhasana, N., & Ahmad, M. Y. (2025). Fraud in the Digital Space: A Comparative Study of Jinayah Fiqh and Indonesian Criminal Law. *Jurnal Hukum Islam*, *23*(1), Article 1. https://doi.org/10.28918/jhi.v23i1.02

Ahyani, H., Putra, H. M., Muharir, M., Rahman, E. T., & Mustofa, M. (2022). Gender Justice in the Sharing of Inheritance and Implementation in Indonesia. *Asy-Syari'ah*, *24*(2), Article 2. https://doi.org/10.15575/as.v24i2.14640

Alhadidi, I., Nweiran, A., & Hilal, G. (2024). The influence of Cybercrime and legal awareness on the behavior of university of Jordan students. *Heliyon*, *10*(12), e32371. https://doi.org/10.1016/j.heliyon.2024.e32371

AllahRakha, N. (2024). Cross-Border E-Crimes: Jurisdiction and Due Process Challenges. *ADLIYA: Jurnal Hukum Dan Kemanusiaan*, *18*(2), Article 2. https://doi.org/10.15575/adliya.v18i2.38633

Anand, G., Purnamawadita, B. E., Nugraha, X., & Rahmat, N. E. (2024). Integrating Sharia Certification in the Notary Profession: A Comparative Legal Analysis, Challenges, and Opportunities in Southeast Asian Countries. *Syariah: Jurnal Hukum Dan Pemikiran*, *24*(2), 271–284. https://doi.org/10.18592/sjhp.v24i2.14334

Bittisnich, D. (2024). Food Safety in Global Trade: Opportunities and Challenges to Trade Harmonization. In G. W. Smithers (Ed.), *Encyclopedia of Food Safety (Second Edition)* (pp. 474–481). Academic Press. https://doi.org/10.1016/B978-0-12-822521-9.00009-5

Chatsuwan, P., Phromma, T., Surasvadi, N., & Thajchayapong, S. (2023). Personal data protection compliance assessment: A privacy policy scoring approach and empirical evidence from Thailand's SMEs. *Heliyon*, *9*(10), e20648. https://doi.org/10.1016/j.heliyon.2023.e20648

Choi, C. W., Choi, Y., Maryuningsih, Y. S., Shin, J. H., Chantarasomchin, P., Mizukami, T., Ng, S. W., Thi, D. L., Ramondrana, D., Dimapilis, G. N., Sohn, K. H., Roh, H. S., Koh, H. J., Lee, W., & Kim, Y. H. (2025). Report of the Ninth Asian National Control Laboratory Network meeting in 2024, with a focus on regional harmonization of regulatory systems to prepare for cross-border transfer of plasma. *Biologicals*, *90*, 101823. https://doi.org/10.1016/j.biologicals.2025.101823

Feng, K., Miranda, A. V., Obnial, J. C., Ebhodaghe, I. D., & Lucero-Prisno, D. E. (2024). Drug regulatory harmonization in the Association of Southeast Asian Nations: Is it time for an ASEAN medicines agency? A policy review. *Clinical Epidemiology and Global Health*, *28*, 101649. https://doi.org/10.1016/j.cegh.2024.101649

Kovatch, C., Kleinstreuer, N., Unruh, C., Lambert, S., & Reinke, E. (2025). Considerations and Guidance for Global Harmonization and Acceptance of Alternative Methods. In *Reference Module in Biomedical Sciences*. Elsevier. https://doi.org/10.1016/B978-0-323-95488-4.00286-2

Li, F., Yigitcanlar, T., Nepal, M., Nguyen, K., & Dur, F. (2023). Machine learning and remote sensing integration for leveraging urban sustainability: A review and framework. *Sustainable Cities and Society*, *96*, 104653. https://doi.org/10.1016/j.scs.2023.104653

Mustofa, K. N., Fakhria, S., Quintana, M. K., Tauziri, Y., & Nainin, D. M. (2024). Religious Authority and Family Law Reform in Indonesia: The Response and Influence of the Indonesian Ulema Council on Interfaith Marriage. *JURIS (Jurnal Ilmiah Syariah)*, *23*(2), 383–393. https://doi.org/10.31958/juris.v23i2.11849

Prawira, F. R., Prakoso, N. T., Handayani, P. W., & Harahap, N. C. (2024). The influence of information security factors on the continuance use of electronic wallet. *Procedia Computer Science*, *234*, 1467–1475. https://doi.org/10.1016/j.procs.2024.03.147

Reddy, S. (2025). Global Harmonization of Artificial Intelligence-Enabled Software as a Medical Device Regulation: Addressing Challenges and Unifying Standards. *Mayo*

Clinic Proceedings: Digital Health, *3*(1), 100191. https://doi.org/10.1016/j.mcpdig.2024.100191

Sacconi, S., Vanoli, F., Stascheit, F., Cortés-Vicente, E., Mantegazza, R., Meisel, A., Meisel, A., Santos, E., Verschuuren, J., Gilhus, N. E., Laforêt, P., Hoen, P.-B., Sacconi, S., Marina, A. D., Antozzi, C., Vicente, E. C., Campana, E. S., Vanoli, F., Stascheit, F., … Pardo, R. (2025). 278th ENMC International Workshop: European standards for harmonization of myasthenia gravis registries and emerging digital solutions. 20th-21st September 2024, Hoofddorp, The Netherlands. *Neuromuscular Disorders*, *51*, 105368. https://doi.org/10.1016/j.nmd.2025.105368

Yi, S., Yam, E. L. Y., Cheruvettolil, K., Linos, E., Gupta, A., Palaniappan, L., Rajeshuni, N., Vaska, K. G., Schulman, K., & Eggleston, K. N. (2024). Perspectives of Digital Health Innovations in Low- and Middle-Income Health Care Systems From South and Southeast Asia. *Journal of Medical Internet Research*, *26*. https://doi.org/10.2196/57612