

E-Commerce and M-Commerce Boom: The Urgent Need for Patent Law Reform in Indonesia

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Abstract

The rapid expansion of e-commerce and mobile commerce (m-commerce) in Indonesia has transformed the business landscape, offering new opportunities but also presenting significant legal challenges. With the rise



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of digital platforms and mobile applications, intellectual property issues, particularly those related to patents, have become increasingly complex. Indonesia's current patent law, rooted in the Patent Law No. 13 of 2016, is struggling to keep pace with the fast-evolving nature of these industries. This study examines the urgent need for patent law reform in Indonesia to address the unique challenges posed by e-commerce and m-commerce innovations, including digital platforms, mobile applications, and software-based inventions. The article argues that the existing legal framework fails to adequately protect new technological advancements, leaving gaps that allow for patent disputes, weak enforcement, and a lack of clarity regarding patent eligibility in the digital economy. By analyzing key issues such as patentability criteria, infringement protection, and cross-jurisdictional patent enforcement, this study proposes targeted reforms to align Indonesia's patent law with international standards, particularly in jurisdictions with robust digital patent protection frameworks, such as the European Union and the United States. The contribution of this study lies in offering a comprehensive analysis of Indonesia's patent law in the context of e-commerce and m-commerce growth, advocating for a legal overhaul that fosters innovation, encourages investment, and ensures stronger protection for digital inventions. These reforms are essential for Indonesia to maintain its competitive edge in the global digital economy.

KEYWORDS *Patent Law, E-Commerce, M-Commerce, Legal Reform, Digital Economy, Intellectual Property*

Introduction

The rapid acceleration of the digital economy has fundamentally reshaped global commercial practices, with e-commerce and mobile commerce (m-commerce) emerging as dominant drivers of economic growth.¹ In Indonesia—one of Southeast Asia's largest and fastest-growing digital markets—this transformation has been particularly pronounced. The digital commerce sector has become a central pillar of national economic development, deeply embedded in everyday life as approximately 80% of the population now has internet access, with mobile devices dominating

¹ Ciupac-Ulici, Maria, et al. "Which factors contribute to the global expansion of m-commerce?." *Electronics* 12, no. 1 (2022): 197; Jannah, Miftahul, Zuhairo Mahmuda, and Amla Alankrita. "The Digital Economy Boom: How E-Commerce is Reshaping Indonesia's Market." *Indonesia Discourse* 2, no. 1 (2025): 33-58; Azam, Arshe, and Azhar Mustafa Ansari. "The emerging role of e-commerce in today's business: A conceptual study." *Asian Journal of Management and Commerce* 5, no. 1 (2024): 428-439.

digital transactions.² This widespread adoption has fueled the proliferation of digital platforms, mobile applications, and data-driven business models, which not only redefine consumer behavior but also intensify competition and innovation across sectors.³

This digital transformation has triggered a structural shift in economic activity, giving rise to new forms of innovation rooted in software, algorithms, artificial intelligence (AI), digital payment systems, and technology-driven logistics integration. As these innovations become increasingly central to commercial value creation, they challenge the adequacy of existing legal frameworks, particularly in the realm of intellectual property law.⁴ Patent law, traditionally designed to protect tangible and industrial-based inventions, now faces mounting pressure to accommodate intangible, software-based, and platform-oriented innovations.⁵ Without adaptive legal reform, Indonesia risks legal uncertainty, increased infringement, and weakened incentives for innovation, potentially undermining both domestic technological development and foreign investment.⁶

Moreover, the expansion of e-commerce and m-commerce has intensified the complexity of intellectual property disputes.⁷ Digital marketplaces facilitate the widespread distribution of pirated products, unauthorized patented technologies, and other forms of infringement, while at the same time offering technological tools that could enhance enforcement through improved traceability and identification of infringing actors. This dual nature underscores the urgent need for a responsive and

² Lestari, Anggia Putri, Syahla Amany Fatiha, and Sylvia Octa Putri. "E-Commerce in Indonesia's Economic Transformation and Its Influence on Global Trade." *International Journal of Computer in Law & Political Science* 4, no. 1 (2024): 10-23.

³ Abdullah, Andi Sumange Alam. "The impact of e-commerce on the growth of MSMEs in Indonesia." *9th International Conference on Accounting, Management, and Economics 2024 (ICAME 2024)*. Atlantis Press, 2025. See also Hoontrakul, Pongsak. "Asia's digital economy." *Economic Transformation and Business Opportunities in Asia*. (Cham: Springer International Publishing, 2017), pp. 269-312.

⁴ Zekos, Georgios I. "E-globalization and digital economy." *Economics and law of artificial intelligence: Finance, economic impacts, risk management and governance*. (Cham: Springer International Publishing, 2021), pp. 13-66; Śledziowska, Katarzyna, and Renata Włoch. *The Economics of Digital Transformation: The Disruption of Markets, Production, Consumption, and Work*. (London: Routledge, 2021).

⁵ See Thambisetty, Sivaramjani. "Legal Transplants in Patent Law: Why "Utility" is the New "Industrial Applicability"?" *Jurimetrics* 49, no. 2 (2009): 155-201.

⁶ See Salam, U., et al. "Indonesia case study: Rapid technological change—challenges and opportunities." *Pathways for Prosperity Commission Background Paper Series* 1, no. 1 (2018): 2009-2019; Butt, Simon. "Foreign investment in Indonesia: The Problem of Legal Uncertainty." In *Foreign Investment and Dispute Resolution Law and Practice in Asia*. (London: Routledge, 2012), pp. 112-134.

⁷ Bass, Kristian. *E-Commerce and Mobile Commerce Technologies*. (Waltham Abbey Essex, UK: Scientific e-Resources, 2018).

forward-looking patent system. The traditional definition of “invention” must evolve to encompass digital processes, computer-implemented inventions, and system-based innovations to ensure comprehensive protection in the modern economy.⁸

In this context, the legal infrastructure governing technological innovation—particularly patent law—faces unprecedented pressure to adapt. An effective and modernized patent regime is essential not only to safeguard innovation but also to provide legal certainty for digital entrepreneurs, encourage technology transfer, and sustain Indonesia’s competitiveness in the global digital economy.⁹ Without such reform, the gap between technological advancement and legal protection will continue to widen, constraining the full potential of Indonesia’s digital transformation.

Despite this dynamic growth, Indonesia’s patent regime, primarily governed by Patent Law No. 13 of 2016, remains largely anchored in traditional conceptions of invention that emphasize tangible and industrial-based innovations. Such a framework is increasingly misaligned with the realities of contemporary digital innovation, where software-based inventions, algorithms, and platform architectures constitute core economic assets. This misalignment creates significant legal uncertainty, particularly regarding patent eligibility, scope of protection, and enforcement mechanisms in the context of e-commerce and m-commerce ecosystems. As a result, innovators and investors encounter ambiguity that may hinder technological advancement and weaken Indonesia’s competitiveness in the global digital economy.¹⁰

Building on these developments, the expansion of e-commerce and m-commerce must also be understood through the lens of patent law theory,

⁸ Kruspig, Sabine, and Claudia Schwarz. *Legal Protection for Computer-implemented Inventions: A Practical Guide to Software-related Patents*. (Zuid-Holland: Kluwer Law International BV, 2016). See also Davis, Lee. "Intellectual property rights, strategy and policy." *Economics of Innovation and New Technology* 13, no. 5 (2004): 399-415.

⁹ Sianipar, Erick Alfredo, and Putri Aisyah. "Perlindungan Hak Kekayaan Intelektual dalam Era Digital: Tantangan dan Solusi Hukum." *Judge: Jurnal Hukum* 3, no. 2 (2022): 62-65; Harnowo, Tri. "Law as technological control of the infringement of intellectual property rights in the digital era." *Corporate and Trade Law Review* 2, no. 1 (2022): 65-79.

¹⁰ See Nnawulezi, Uche, et al. "Protection of Patent Holders’ Rights in Indonesia: Between Theories and Practices." *Journal of Private and Commercial Law* 7, no. 1 (2023): 19-44; Waspiah, Waspiah, et al. "Indonesian Patent Law Reform for Simple Patent Innovations on Achieving Welfare State Objectives." *Journal of Indonesian Legal Studies* 8, no. 1 (2023): 199-242. See also Irawaty, Irawaty, et al. "Increasing Understanding of the Urgency of Trade Secrets for Business to Gen Z at SMAN 1 Semarang." *Indonesian Journal of Legal Community Engagement* 6, no. 2 (2023): 289-304.

particularly in relation to the protection of technological innovations underpinning digital commerce systems. Core components of digital platforms—such as algorithms, electronic payment mechanisms, data security architectures, and personalized recommendation systems—potentially qualify as patentable subject matter, provided they satisfy the requirements of novelty, inventive step, and industrial applicability. However, the rapid evolution of such technologies exposes the limitations of traditional patent frameworks, which were not originally designed to accommodate software-driven and system-based innovations.¹¹ Consequently, Indonesia's patent regime faces increasing pressure to evolve in order to remain relevant and effective in the digital era.

In response to these challenges, Indonesia has undertaken significant legal reform through the enactment of Law No. 65 of 2024, the Third Amendment to Law No. 13 of 2016 on Patents, which came into force on 28 October 2024. This reform represents a critical step toward aligning the national patent system with contemporary technological developments. One of the most notable changes is the expanded definition of "invention," which now explicitly includes "systems, methods, and uses," thereby opening greater legal space for the protection of digital and computer-implemented innovations.¹² This shift is particularly important for e-commerce and m-commerce actors, whose innovations often lie in intangible and process-oriented technologies rather than traditional physical products.

In addition to substantive changes, the amendment introduces procedural and institutional improvements aimed at enhancing accessibility and efficiency. These include the simplification of patent registration processes, acceleration of examination procedures, and the introduction of incentive mechanisms for researchers and micro, small, and medium enterprises (MSMEs). Such measures are designed to encourage greater participation in the patent system, especially among digital entrepreneurs who require timely and reliable protection for rapidly evolving innovations.¹³

¹¹ Ouyang, Xin, Zhen Sun, and Xinzhen Xu. "Patent system in the digital era- Opportunities and new challenges." *Journal of Digital Economy* 1, no. 3 (2022): 166-179.

¹² Aulia, M. Zulfa. "Politik Hukum Pembentukan UU Paten di Indonesia: Industrialisasi, Liberalisasi, dan Harmonisasi." *Jurnal Hukum Ius Quia Iustum* 22, no. 2 (2015): 223-237.

¹³ See Hidayat, Taufik, Muskibah Muskibah, and Indriya Fathni. "Pendaftaran Merek Sebagai Bentuk Perlindungan Hukum Pada UMKM." *Zaaken: Journal of Civil and Business Law* 3, no. 3 (2022): 431-447; Chaliva, Ireyna, and Dwi Desi Yayi Tarina. "Penerapan Percepatan Layanan Paten Sederhana Pada Undang-Undang Cipta Kerja." *Jurnal USM Law Review* 6, no. 3 (2023): 1109-1123.

Nevertheless, while Law No. 65 of 2024 marks a significant advancement, questions remain regarding its practical effectiveness in addressing the complex realities of digital commerce. The extent to which the revised framework can resolve persistent issues—such as ambiguity in patent eligibility for software-based inventions, enforcement in digital environments, and cross-border infringement—continues to warrant critical examination.¹⁴ As such, this reform should be viewed not as a final solution, but as part of an ongoing process of legal adaptation in response to the accelerating dynamics of the digital economy.

The challenges are further compounded by the inherently borderless nature of digital commerce. E-commerce and m-commerce platforms operate across jurisdictions, raising complex questions related to cross-border patent enforcement, jurisdictional conflicts, and harmonization with international intellectual property standards.¹⁵ While jurisdictions such as the United States and the European Union have progressively refined their legal approaches to accommodate digital and software-related inventions¹⁶, Indonesia's regulatory framework has yet to undergo comparable evolution. This gap not only limits effective protection for domestic innovators but also risks deterring foreign investment in Indonesia's digital sector.

In addition, the urgency for patent law reform in Indonesia becomes evident. Existing legal provisions are insufficient to address critical issues such as the patentability of computer-implemented inventions, the protection of platform-based innovations, and the enforcement of rights in digitally mediated markets.¹⁷ Without comprehensive reform, the current system risks fostering legal fragmentation, increasing disputes, and undermining the innovation ecosystem that underpins e-commerce and m-commerce growth.

¹⁴ See Republic of Indonesia. *Undang-undang (UU) Nomor 65 Tahun 2024 tentang Perubahan Ketiga atas Undang-Undang Nomor 13 Tahun 2016 tentang Paten*. (Jakarta: Sekretariat Negara, 2024). Available online at <https://peraturan.bpk.go.id/Details/306515/uu-no-65-tahun-2024>

¹⁵ Priyambodo, Lukas, F. Suyoto Tjiptono, and M. Suyoto. "M-Commerce in Indonesia: Problems and Prospects." *International Journal of Computer Applications & Information Technology* 1, no. 2 (2012): 71-76; Sirait, Ningrum Natasya. "E-commerce growth and development, impact, and challenges in Indonesia." *Neoclassical Legal Review: Journal of Law and Contemporary Issues* 1, no. 2 (2022): 54-72.

¹⁶ McQueen, Douglas H. "Growth of software related patents in different countries." *Technovation* 25, no. 6 (2005): 657-671; Cohen, Julie E., and Mark A. Lemley. "Patent scope and innovation in the software industry." *California Law Review* 89, no. 1 (2001): 1-57.

¹⁷ See Rosser, Andrew. "The political economy of institutional reform in Indonesia: the case of intellectual property law." *Law, Capitalism and Power in Asia*. (London: Routledge, 2006), pp. 80-99; Budi, V. Henry Soelistyo. "Policy Study In Indonesia's Patent Legal System." *Law Reform* 15, no. 2 (2019): 206-224.

This study aims to critically examine the adequacy of Indonesia's patent law in responding to the challenges posed by the rapid expansion of e-commerce and m-commerce. It seeks to identify key legal gaps and structural weaknesses within the current framework, particularly in relation to patentability criteria, infringement protection, and cross-jurisdictional enforcement. Furthermore, the study draws comparative insights from more advanced jurisdictions to propose targeted and contextually appropriate reforms. By doing so, this research contributes to the broader discourse on intellectual property law in the digital age and offers practical recommendations to strengthen Indonesia's legal infrastructure.

Digital Transformation and the Expansion of E-Commerce and M-Commerce in Indonesia

Digital transformation has become a defining feature of contemporary economic development, particularly in emerging markets such as Indonesia.¹⁸ Over the past few decades, rapid advancements in information and communication technologies have fundamentally reshaped business activities, altering how firms create, deliver, and capture value.¹⁹ As noted by Erik Brynjolfsson and Andrew McAfee, digital technologies function as general-purpose technologies that drive productivity and innovation across sectors.²⁰ In this context, digitalization has enabled firms in Indonesia to transcend traditional limitations of geography and scale, accelerating their integration into the global digital economy.

The transformation of business processes through digitalization aligns with the theoretical framework of disruptive innovation proposed by Clayton Christensen. Christensen²¹ argues that new technologies often disrupt established industries by offering simpler, more accessible, and cost-effective solutions. In Indonesia, digital platforms have disrupted conventional retail by providing consumers with alternatives that are more

¹⁸ Ansong, Eric, and Richard Boateng. "Surviving in the digital era—business models of digital enterprises in a developing economy." *Digital Policy, Regulation and Governance* 21, no. 2 (2019): 164-178.

¹⁹ Rust, Roland T., and Francine Espinoza. "How technology advances influence business research and marketing strategy." *Journal of Business Research* 59, no. 10-11 (2006): 1072-1078.

²⁰ Brynjolfsson, Erik, and Andrew McAfee. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. (New York: W.W. Norton & Company, 2014).

²¹ Christensen, Clayton M. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. (Boston: Harvard Business School Press, 1997).

efficient and user-friendly. This disruption has compelled traditional businesses to adopt hybrid models, combining offline and online strategies to remain competitive in an increasingly digital marketplace.²²

Consumer behavior has also undergone significant transformation as a result of digital adoption. According to Philip Kotler, the shift toward digital consumption reflects the evolution from traditional to connected consumers, who prioritize convenience, speed, and personalization.²³ In Indonesia, this trend is particularly evident among younger, tech-savvy populations who rely heavily on smartphones for daily transactions. The rise of mobile-first consumers has fueled the growth of mobile commerce (m-commerce), reinforcing the importance of responsive design, seamless user interfaces, and integrated payment systems.²⁴

E-commerce platforms have emerged as central actors in Indonesia's digital economy. Companies such as Tokopedia, Shopee, and Bukalapak exemplify how digital marketplaces facilitate transactions between buyers and sellers across vast geographical areas.²⁵ These platforms leverage network effects, as described in platform economy theory, where the value of the platform increases with the number of users.²⁶ This has enabled rapid scaling and market penetration, particularly in a geographically dispersed country like Indonesia.

The expansion of mobile commerce further reflects the integration of digital technologies into everyday life. With high smartphone penetration, m-commerce has become a dominant channel for online transactions. The Technology Acceptance Model (TAM), developed by Fred Davis, provides insight into this phenomenon, emphasizing perceived usefulness and ease of use as key determinants of technology adoption.²⁷ Indonesian consumers' increasing reliance on mobile applications underscores the importance of

²² See also Kraus, Sascha, et al. "Digital entrepreneurship: A research agenda on new business models for the twenty-first century." *International Journal of Entrepreneurial Behavior & Research* 25, no. 2 (2019): 353-375.

²³ Kotler, Philip, Hermawan Kartajaya, and Iwan Setiawan. *Marketing 4.0: Moving from Traditional to Digital*. (Hoboken: Wiley, 2017).

²⁴ See Skare, Marinko, and Domingo Riberio Soriano. "How globalization is changing digital technology adoption: An international perspective." *Journal of Innovation & Knowledge* 6, no. 4 (2021): 222-233.

²⁵ See Jiang, Ling, Zhilin Yang, and Minjoon Jun. "Measuring consumer perceptions of online shopping convenience." *Journal of Service Management* 24, no. 2 (2013): 191-214.

²⁶ Parker, Geoffrey G., Marshall W. Van Alstyne, and Sangeet Paul Choudary. *Platform Revolution: How Networked Markets Are Transforming the Economy*. (New York: W.W. Norton & Company, 2016).

²⁷ Davis, Fred D. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology." *MIS Quarterly* 13, no. 3 (1989): 319-340.

intuitive design and reliable digital infrastructure in fostering user trust and engagement.

Digital transformation has also catalyzed the growth of related industries such as fintech, edutech, and digital entertainment. Fintech platforms, in particular, have enhanced financial inclusion by providing access to digital payments, lending, and investment services. This aligns with the broader concept of inclusive innovation, which emphasizes the role of technology in addressing socio-economic disparities.²⁸ In Indonesia, fintech solutions have enabled unbanked populations to participate in the formal financial system, thereby contributing to economic development.

From a regulatory perspective, the Indonesian government has introduced various legal frameworks to support digital transformation while ensuring consumer protection and data security. The enactment of the Electronic Information and Transactions Law (*Undang-Undang Informasi dan Transaksi Elektronik*) represents a significant step toward regulating online activities.²⁹ Additionally, policies related to data protection and digital taxation have been implemented to create a more secure and equitable digital ecosystem. These legal measures reflect the state's role in balancing innovation with accountability.

Moreover, the concept of digital ecosystems has become increasingly relevant in understanding Indonesia's e-commerce landscape. According to Jacobides, Cennamo, and Gawer³⁰, digital ecosystems consist of interconnected actors, including platforms, service providers, and users, who co-create value. In Indonesia, e-commerce platforms collaborate with logistics providers, payment gateways, and social media networks to deliver comprehensive services. This interconnectedness enhances efficiency and fosters innovation across the value chain.

Logistics and infrastructure development play a crucial role in supporting e-commerce growth in Indonesia. Given the country's archipelagic geography, efficient delivery systems are essential for ensuring timely and reliable service. Investments in digital logistics, including real-time tracking and automated warehousing, have improved operational

²⁸ Heeks, Richard, et al. "Inclusive Innovation: Definition, Conceptualisation and Future Research Priorities." *Development Informatics Working Paper* No. 53, University of Manchester, 2014.

²⁹ See and refer to Republic of Indonesia. *Undang-Undang Nomor 1 Tahun 2024 tentang Perubahan Kedua Atas Undang-Undang Nomor 11 Tahun 2008 tentang Informasi dan Transaksi Elektronik*. (Jakarta: Sekretariat Negara, 2008). Available online at https://jdih.komdigi.go.id/produk_hukum/view/id/884/t/undangundang+nomor+1+tahun+2024

³⁰ Jacobides, Michael G., Carmelo Cennamo, and Annabelle Gawer. "Towards a Theory of Ecosystems." *Strategic Management Journal* 39, no. 8 (2018): 2255–2276.

efficiency. These advancements align with supply chain management theories that emphasize the importance of integration and coordination in achieving competitive advantage.³¹

Despite its rapid growth, digital transformation in Indonesia faces several challenges. Issues such as digital inequality, cybersecurity risks, and limited digital literacy continue to hinder inclusive participation. Scholars such as Van Dijk³² highlight the persistent digital divide, which affects access to technology and the ability to benefit from digital innovations. Addressing these challenges requires coordinated efforts from government, private sector, and civil society to ensure that digital transformation is both inclusive and sustainable.

Furthermore, trust remains a critical factor influencing the adoption of e-commerce and m-commerce. Theories of online trust, such as those proposed by Gefen, Karahanna, and Straub³³, emphasize the importance of perceived security, privacy, and reliability in shaping consumer behavior. In Indonesia, building trust involves implementing robust cybersecurity measures, transparent policies, and effective customer service. Platforms that successfully establish trust are more likely to retain users and achieve long-term growth.

Therefore, at this point, digital transformation has significantly expanded e-commerce and m-commerce in Indonesia, reshaping business practices and consumer behavior. The integration of advanced technologies, supported by theoretical frameworks such as disruptive innovation, TAM, and platform economy theory, has driven this transformation. While regulatory frameworks and infrastructure development have facilitated growth, challenges related to inequality and trust must be addressed to ensure sustainable progress. As Indonesia continues to embrace digitalization, its experience offers valuable insights into the dynamics of digital economies in emerging markets.

Patent Law Reform and Its Implications for Digital Innovation

E-commerce and m-commerce are two terms that have gained popularity alongside the advancement of technology and the internet. Both

³¹ Christopher, Martin. *Logistics & Supply Chain Management*. 5th ed. (Harlow: Pearson, 2016).

³² Van Dijk, Jan A. G. M. *The Digital Divide*. (Cambridge: Polity Press, 2020).

³³ Gefen, David, Elena Karahanna, and Detmar W. Straub. "Trust and TAM in Online Shopping: An Integrated Model." *MIS Quarterly* 27, no. 1 (2003): 51–90.

play significant roles in driving digital trade, though they differ fundamentally. E-commerce, short for electronic commerce, encompasses all commercial transactions conducted electronically via the internet. Essentially, e-commerce includes the buying and selling of goods or services through computer networks, typically using desktops or laptops. Websites such as Amazon, eBay, and Tokopedia are clear examples of this form. The primary advantages of e-commerce include its convenience allowing transactions anytime and anywhere as long as there is internet access. Moreover, e-commerce enables companies to reach global markets without geographical limitations. However, accessibility issues remain, particularly for users who rely solely on mobile devices or reside in areas with limited internet connectivity.

M-commerce, or mobile commerce, represents an evolution of e-commerce that focuses on transactions conducted via mobile devices such as smartphones or tablets. Unlike e-commerce, which is commonly accessed through computers, m-commerce emphasizes convenience through mobile-optimized applications or websites. With the increasing global adoption of smartphones, m-commerce has experienced substantial growth, as many traditional e-commerce platforms have extended their services to mobile applications. Moreover, m-commerce facilitates faster and more personalized transactions through notifications and location-based offers.⁸ Its key advantages lie in flexibility and accessibility, enabling users to make transactions on the go. Nevertheless, m-commerce also faces challenges such as limited screen size and potential security risks associated with device loss or theft.³⁴

Both e-commerce and m-commerce have significantly contributed to the expansion of the digital economy. E-commerce opened opportunities for businesses to enter international markets, while m-commerce further enhanced accessibility for users in developing regions where smartphone usage outpaces access to computers. As these platforms evolve, the law must be adaptive and responsive to provide adequate protection for both entrepreneurs and consumers, including inventors. The concept of responsive law was articulated by Philippe Nonet and Philip Selznick, who

³⁴ Maamar, Zakaria. "Commerce, e-commerce, and m-commerce: what comes next?." *Communications of the ACM* 46, no. 12 (2003): 251-257. See also Niranjanamurthy, M., et al. "Analysis of e-commerce and m-commerce: advantages, limitations and security issues." *International Journal of Advanced Research in Computer and Communication Engineering* 2, no. 6 (2013): 2360-2370; Lucas, Gabriel Almeida, Guilherme Lerch Lunardi, and Décio Bittencourt Dolci. "From e-commerce to m-commerce: An analysis of the user's experience with different access platforms." *Electronic Commerce Research and Applications* 58 (2023): 101240.

argue that law should serve as a sociological construct responsive to social needs and public aspirations.³⁵

A responsive legal system maintains institutional integrity while remaining open to social change and innovation.³⁶ It upholds justice not merely through procedural mechanisms but through substantive fairness, ensuring that laws accommodate societal transformations brought by digital technologies.³⁷ According to Warasih, responsive law seeks to balance integrity with openness by recognizing essential institutional values while acknowledging emerging social forces.³⁸ Rahardjo emphasizes that responsive law should be guided by concrete objectives that serve as evaluative standards for reform³⁹, while Suriasumantri highlights its commitment to uncovering implicit social values within legal norms and policies.⁴⁰

In the context of e-commerce and m-commerce, patent law reform becomes essential to address empirical challenges faced by inventors in the digital economy. Legal renewal must not only respond to technological realities but also uphold human dignity by protecting inventors' intellectual property rights. Patents are granted by the state to ensure exclusive rights to inventors, preventing unauthorized use, production, or commercialization of patented inventions. Hence, the law must evolve alongside technological progress to ensure fairness, innovation, and justice in the digital age.⁴¹

Indonesia enacted Law No. 65 of 2024 concerning the Third Amendment to Law No. 13 of 2016 on Patents, which introduces a series of significant reforms to the national patent protection system. The enactment of Law No. 65 of 2024 brings substantial changes that are expected to enhance the efficiency and effectiveness of the patent system in Indonesia.

³⁵ Nonet, Philippe, Philip Selznick, and Robert A. Kagan. *Law and Society in Transition: Toward Responsive Law*. (London: Routledge, 2017). See also Lindblom, Charles E. "Who needs what social research for policymaking?." *Knowledge* 7, no. 4 (1986): 345-366.

³⁶ See Bauer, Johannes M. "Regulation and Digital Innovation." In *The Future of the Internet: Innovation, Integration and Sustainability*. (Baden-Baden: Nomos, 2018).

³⁷ Utsman, Sabian. *Menuju Penegakan Hukum Responsif*. (Yogyakarta: Pustaka Pelajar, 2008).

³⁸ Warasih, Esmi. *Pranata Hukum Sebuah Telaah Sosiologis*. (Semarang: Suryandaru Utama, 2006).

³⁹ Rahardjo, Satjipto. *Penegakan Hukum Progresif*. (Jakarta: Penerbit Buku Kompas, 2010).

⁴⁰ Suriasumantri, Jujun S. *Filsafat Ilmu Sebuah Pengantar Populer*. (Jakarta: Pustaka Sinar Harapan, 2003).

⁴¹ Hutasoit, Rona, and Annisa Hayya Nadhrah. "Perlindungan Serta Penerapan Hak Paten dalam Perspektif Hukum di Indonesia." *Jurnal Pendidikan Kewarganegaraan Undiksha* 11, no. 2 (2023): 151-159.

Several key amendments contained in this new legislation include the following:

1) *Simplification of Patent Registration Procedures*

One of the most notable changes is the simplification of patent registration procedures, which facilitates inventors in submitting their patent applications. This reform aims to reduce excessive bureaucratic processes, thereby making the registration process faster and more efficient. Indonesia has now adopted a digital-based patent registration system that enables inventors to file patent applications online. Through this system, accessibility to patent registration becomes easier, particularly for inventors located in remote areas or those unable to directly access patent registration services.

In addition, the new law provides greater clarity regarding the provisions on compulsory licensing. Compulsory licenses allow third parties to use a patented invention that has been granted exclusive rights, particularly in circumstances relating to public interest or national industrial development. This provision aims to prevent monopolistic practices and to ensure that patents yield broader benefits for society as a whole.

2) *Amendment to the Provisions on Non-Patentable Inventions*

The 2024 Patent Law also introduces new provisions concerning inventions that are not eligible for patent protection, such as computer programs that are protected solely by copyright law, unless such programs are implemented in a technology or function that meets the requirements of patentability. This provision seeks to provide legal certainty in differentiating between patentable technical innovations and creative works that fall under the domain of copyright protection.

3) *Enhancement of Rules Related to Traditional Knowledge and Genetic Resources*

The new legislation also provides clearer regulation regarding the protection of traditional knowledge and genetic resources. Indonesia aligns its legal framework with international standards established by the World Intellectual Property Organization (WIPO), ensuring that inventions derived from traditional knowledge or genetic resources originating from indigenous communities receive appropriate and equitable protection. This enhancement reflects Indonesia's commitment to preserving cultural heritage while ensuring that intellectual property rights are exercised fairly.

4) *Extension of the Grace Period*

The grace period defined as the time interval following the first disclosure of an invention during which the inventor may still file a

patent application without forfeiting novelty has been extended from six months to one year. This extension affords inventors additional time to finalize their patent applications after publicly disclosing their findings, thus providing greater flexibility and legal certainty in the filing process.

5) *Initiatives to Encourage Innovation from Micro, Small, and Medium Enterprises (MSMEs) and Educational Institutions*

Indonesia continues to actively participate in various international patent agreements and initiatives, such as the Patent Cooperation Treaty (PCT). Through participation in the PCT, Indonesian inventors are enabled to file international patent applications and obtain patent protection in multiple jurisdictions. This measure is expected to create wider opportunities for Indonesian products and technologies to enter global markets and compete internationally, thereby strengthening Indonesia's position within the global innovation ecosystem.

6) *Impact of Patents on the National Economy and Innovation*

With the implementation of improved regulations and a more efficient patent system, Indonesia is anticipated to experience an increase in the number of patent applications filed domestically. Patents not only provide economic advantages to right holders but also stimulate knowledge- and technology-based economic growth. Innovations protected under patent law can contribute to industrial progress, job creation, and the development of the technology and research sectors.

The reform of Indonesia's patent system through the enactment of Law No. 65 of 2024 represents a crucial step toward supporting innovation and technological advancement. These changes not only facilitate easier patent registration but also strengthen Indonesia's competitiveness in the global intellectual property landscape. With an improved patent ecosystem, Indonesia possesses the potential to become a more innovative and competitive nation, thereby accelerating the development of a technology-driven economy. The enactment of this law is expected to bring broad and positive impacts not only for inventors but also for society and the Indonesian economy as a whole.⁴²

The reform of Indonesia's patent system through the enactment of Law No. 65 of 2024 represents a pivotal step in supporting innovation and technological development. This amendment not only facilitates the process of patent registration but also ensures that Indonesia can remain competitive at the global level in the field of intellectual property. With a

⁴² Nugroho, Agung, and Faisal Santiago. "The effect of patent rights on innovation of the technology industry in Indonesia." *Journal Research of Social Science Economics and Management* 2, no. 11 (2023): 2610-2620.

more robust patent ecosystem, Indonesia possesses the potential to become a more innovative and competitive nation, thereby accelerating the growth of a technology-based economy. Such reforms are expected to generate wide ranging positive impacts, benefiting not only inventors but also society and the national economy as a whole.

Recent developments in patent law have opened new avenues for the patenting of inventions in the fields of e-commerce, internet technologies, and business methods. For instance, provided that all patentability requirements are satisfied, patents may be granted for inventions in the domain of e-commerce (e.g., new methods of marketing and/or distributing products using the internet); inventions in the field of internet service provision (e.g., new types of network architecture for the internet); inventions related to software paradigms implemented through the internet (e.g., new speech or image processing routines used to transmit and receive signals online); or inventions concerning novel business methods (e.g., new ways of marketing and/or distributing products that do not necessarily require the use of the internet, new pedagogical methods, innovative techniques for providing financial advice, new methods for ensuring building security, or new business operation models). Such inventions may qualify as patentable subject matter, whether or not they make use of the internet, and may consist of combinations of software and business methods, software alone, or business methods alone.

The rapid growth of digital commerce has given rise to a variety of inventions, including transaction algorithms, digital payment systems, intelligent logistics applications, and the integration of artificial intelligence in marketing. Nevertheless, many digital innovations remain difficult to patent due to persistent uncertainty regarding the patentability of software based inventions. The amendment of Indonesia's Patent Law introduces several key reforms, including:

- 1) simplification of the patent registration procedure;
- 2) expansion of the definition of "invention" to include digital technology based innovations; and
- 3) acceleration of substantive examination processes for digital inventions.⁴³

Despite the progressive nature of these new regulations, a number of substantive and procedural challenges remain, namely:

⁴³ See Direktorat Jenderal Kekayaan Intelektua Kementerian Hukum dan HAM Republik Indonesia. "Memasuki Kuartal II 2025, Tren Paten dalam Negeri Meningkat Stabil", 2025, retrieved from <https://kepri.kemenkum.go.id/berita-utama/memasuki-kuartal-ii-2025-tren-paten-dalam-negeri-meningkat-stabil>.

- 1) ambiguity in the legal definition of digital inventions, particularly in relation to software and algorithms;
- 2) the increased frequency of patent disputes arising from the globalized nature of e-commerce; and
- 3) limited human resource capacity among patent examiners with expertise in advanced digital technologies.

To foster a conducive environment for digital innovation, the reform of Indonesia's patent law should be directed toward:

- 1) adopting a more inclusive patent system that accommodates software and algorithm based inventions;
- 2) harmonizing Indonesia's patent law with international standards;
- 3) strengthening institutional capacity, including the training of patent examiners in digital technology; and
- 4) establishing more efficient dispute resolution mechanisms for digital patent cases.

The trend toward integrating artificial intelligence (AI) features, chatbots, and digital payment methods represents a defining characteristic of the evolution of modern e-commerce.⁴⁴ The rapid expansion of both e-commerce and mobile commerce (m-commerce) has resulted in increasingly complex challenges related to intellectual property (IP) infringement. Counterfeit goods, illegal patents, and trademark violations are often widely marketed through online marketplaces. The Directorate General of Intellectual Property (*Direktorat Jenderal Kekayaan Intelektual* DJKI) has recorded that collaborations with major platforms such as Tokopedia and Shopee have been initiated to curb widespread IP infringement practices.

Persistent Challenges and the Need for Adaptive Patent Governance in Indonesia's Digital Economy

The rapid expansion of e-commerce and m-commerce in Indonesia has not only accelerated economic growth but also intensified complex legal challenges, particularly in the domain of intellectual property (IP) governance. While digital platforms have enabled unprecedented market access, they have simultaneously facilitated large-scale infringements of

⁴⁴ Mahran, Zahra Afina, and Muhamad Hasan Sebyar. "Pengaruh Peraturan Menteri Perdagangan (PERMENDAG) Nomor 31 Tahun 2023 terhadap Perkembangan E-commerce di Indonesia." *Hakim: Jurnal Ilmu Hukum dan Sosial* 1, no. 4 (2023): 51-67.

copyright, patents, and trademarks. As digital goods and services become increasingly intangible and easily replicable, traditional enforcement mechanisms struggle to keep pace with the borderless and anonymous nature of online transactions.⁴⁵ This phenomenon underscores the urgent need for adaptive patent governance frameworks capable of addressing the scale and sophistication of digital infringement.

One of the most pressing issues is the exponential scale of IP violations within digital marketplaces. Unlike conventional markets, where physical oversight is feasible, online platforms enable infringing products to circulate rapidly across vast networks. Theories of digital capitalism, as articulated by Nick Srnicek, suggest that platform-based economies inherently prioritize growth and user engagement, sometimes at the expense of regulatory compliance.⁴⁶ In Indonesia, this dynamic has allowed counterfeit and infringing goods to proliferate, challenging both regulators and legitimate businesses.

Compounding this issue is the persistent weakness in law enforcement. Although takedown mechanisms exist under the Electronic Information and Transactions Law, enforcement remains reactive rather than preventive. Infringing actors frequently reappear under new digital identities, exploiting gaps in platform verification systems. According to Lessig's theory of "code as law," digital architectures themselves regulate behavior.⁴⁷ However, platform governance in Indonesia has yet to fully integrate robust identity verification and automated compliance systems.

To clarify the structural challenges, Table 1 categorizes key issues in Indonesia's digital IP landscape:

TABLE 1. Core Challenges in Digital IP Governance

Challenge Category	Description	Structural Cause	Legal Implication
Scale of Infringement	Mass dissemination of counterfeit goods online	Platform network effects	Difficulty in monitoring and enforcement
Weak Enforcement	Re-emergence of infringers after takedown	Lack of identity verification systems	Reduced deterrence
Regulatory Fragmentation	Overlapping but uncoordinated laws	Sectoral legal development	Legal uncertainty

⁴⁵ Suhaeruddin, Uha. "Hak Kekayaan Intelektual dalam Era Digital: Tantangan Hukum dan Etika dalam Perlindungan Karya Kreatif dan Inovasi." *Jurnal Hukum Indonesia* 3, no. 3 (2024): 122-128.

⁴⁶ Srnicek, Nick. *Platform Capitalism*. (Cambridge: Polity Press, 2017).

⁴⁷ Lessig, Lawrence. *Code and Other Laws of Cyberspace*. (New York: Basic Books, 1999).

Challenge Category	Description	Structural Cause	Legal Implication
Technological Disruption	Emergence of AI, blockchain, Web 3.0	speed innovation cycles	Outdated legal definitions

Regulatory fragmentation further exacerbates these challenges. Existing legal instruments, including the Patent Law No. 13 of 2016, the Electronic Information and Transactions Law, and consumer protection frameworks, operate in parallel but lack harmonization. This fragmentation creates legal uncertainty, particularly in addressing emerging forms of commerce such as social commerce. Abbott and Snidal⁴⁸ emphasize that fragmented governance systems reduce compliance and effectiveness.

Technological acceleration adds another layer of complexity. Innovations in AI, blockchain, and Web 3.0 challenge traditional patent doctrines, particularly regarding patentability criteria such as novelty and inventive step. Within Intellectual Property Law, scholars argue that software-based inventions often blur the boundary between abstract ideas and technical applications.⁴⁹

Indonesia's 2024 patent reform represents a strategic response to these evolving challenges. The reform aims to modernize legal infrastructure and align it with digital innovation dynamics. Key reform components are summarized in Table 2.

TABLE 2. Key Features of Indonesia's 2024 Patent Reform

Reform Component	Description	Policy Objective	Expected Impact
Accelerated Patent Process	Faster publication and examination timelines	Reduce administrative delays	Increased patent filings
Patent Execution Statement	Mandatory commercialization commitment	Encourage downstream innovation	Higher economic utilization of patents
Compulsory Licensing Reform	Strengthened provisions for public access	Balance private rights and public interest	Improved accessibility
Digital Ecosystem Alignment	Inclusion of fintech, AI, and	Adapt to digital economy	Greater legal relevance

⁴⁸ Abbott, Kenneth W., and Duncan Snidal. "Hard and Soft Law in International Governance." *International Organization* 54, no. 3 (2000): 421–456.

⁴⁹ Bessen, James, and Michael J. Meurer. *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk*. (Princeton: Princeton University Press, 2008).

Reform Component	Description	Policy Objective	Expected Impact
	app-based innovations		

The introduction of the patent execution statement reflects a shift toward a utilitarian model of patent law. As argued by Edmund Kitch, patents function not only as protective instruments but also as mechanisms for coordinating innovation and investment.⁵⁰ By linking patent protection to commercialization, Indonesia promotes practical application rather than mere legal ownership.

The strengthening of compulsory licensing provisions aligns with international standards under the World Trade Organization framework. This ensures that patents contribute to broader societal welfare, particularly in critical sectors. Such measures reflect a balance between exclusivity and accessibility in IP governance.

Empirical evidence indicates that these reforms have had measurable impacts. According to the Directorate General of Intellectual Property, patent applications have increased significantly. Table 3 illustrates recent trends.

TABLE 3. Patent Application Trends in Indonesia (2022–2025)

Year	Number of Applications	Growth Rate (%)	Key Driver
2022	5,120	—	Post-pandemic digital recovery
2023	5,870	14.6%	Growth in e-commerce innovation
2024	6,757	15.1%	Legal reform implementation
2025*	7,300 (Q1 est.)	—	Surge in digital patent filings

*Estimated data based on early 2025 reports.

Indonesia's surge in filings has even surpassed major economies such as China and the United States in early 2025. However, as Jaffe and Lerner⁵¹ caution, rapid growth in patent filings may strain examination capacity and raise concerns regarding patent quality. The government has also

⁵⁰ Kitch, Edmund W. "The Nature and Function of the Patent System." *Journal of Law and Economics* 20, no. 2 (1977): 265–290.

⁵¹ Jaffe, Adam B., and Josh Lerner. *Innovation and Its Discontents*. (Princeton: Princeton University Press, 2004).

emphasized educational initiatives to strengthen IP awareness. Programs conducted by Universitas Gadjah Mada highlight the importance of patent disclosure and commercialization. These initiatives align with national innovation system theory⁵², which stresses the interaction between academia, industry, and government.

Despite progress, enforcement remains a critical weakness. The decentralized nature of digital platforms complicates jurisdictional authority, especially in cross-border transactions. As Drahos⁵³ argues, effective IP enforcement increasingly requires international coordination and regulatory interoperability. Moreover, institutional limitations persist, including shortages of technical experts and administrative inefficiencies. These constraints hinder the effective implementation of patent reforms and reduce the overall responsiveness of the legal system.

Looking forward, Indonesia must adopt a more adaptive patent governance model. This includes integrating technological solutions such as AI-based monitoring systems and blockchain registries to enhance transparency and enforcement. Such innovations would operationalize Lessig's concept of "code as law" within the Indonesian regulatory context. Therefore, while Indonesia has made significant strides in modernizing its patent system, the challenges of digital transformation require continuous legal and institutional adaptation. By strengthening regulatory coherence, enhancing enforcement mechanisms, and leveraging technological tools, Indonesia can position itself as a leading digital innovation hub in Southeast Asia.

Conclusion

In conclusion, the expansion of e-commerce and m-commerce in Indonesia has generated profound implications for the evolution of patent law, particularly in redefining the boundaries of what constitutes a patentable invention in the digital economy. Earlier frameworks such as Patent Law No. 14 of 2001 did not explicitly accommodate business methods, focusing instead on conventional technological inventions that satisfy the criteria of novelty, inventive step, and industrial applicability. The transition to Patent Law No. 13 of 2016, as amended by Law No. 65 of 2024, reflects a more progressive approach by recognizing that while

⁵² Lundvall, Bengt-Åke, ed. *National Systems of Innovation: Toward a Theory of Innovation and Interactive Learning*. Vol. 1. (London: Anthem Press, 2010).

⁵³ Drahos, Peter. *The Global Governance of Knowledge: Patent Offices and Their Clients*. (Cambridge: Cambridge University Press, 2010).

business methods per se remain excluded from patentability, the underlying technological systems—such as algorithms, payment infrastructures, and platform architectures—may qualify for protection under Articles 4(c), 4(d), 5, 7, 8, and 9. This doctrinal shift demonstrates Indonesia's attempt to reconcile classical patent principles with the realities of digital innovation. Nevertheless, as the analysis has shown, the effectiveness of this framework remains constrained by regulatory fragmentation, enforcement weaknesses, and the accelerating complexity of emerging technologies. Thus, the core issue is not only normative adequacy but also the capacity of patent governance to function dynamically within a platform-based and data-driven economy.

Looking forward, the renewal of patent law in Indonesia must move beyond incremental reform toward a more adaptive, integrated, and innovation-oriented governance model. This requires harmonizing patent regulations with the Electronic Information and Transactions Law and other digital economy frameworks, while simultaneously strengthening enforcement mechanisms through technological solutions such as AI-assisted monitoring and blockchain-based registries. Institutional reinforcement, particularly within the Directorate General of Intellectual Property, is essential to ensure both the quality and efficiency of patent examination in the face of rising application volumes. Moreover, sustained collaboration between government, academia, and industry must be prioritized to clarify the legal status of digital inventions and to promote downstream commercialization. At the international level, engagement with regimes such as the World Trade Organization will be critical in addressing cross-border infringement and ensuring regulatory interoperability. Through these strategic measures, Indonesia can develop a resilient patent system capable of supporting long-term innovation while maintaining legal certainty in an increasingly complex digital landscape.

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Patents are the currency of innovation.

Marshall Phelps

*An intellectual property strategist and
former executive at a large tech company.*

DECLARATION OF CONFLICTING INTERESTS

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