



Digital Democracy and Open Finance Technology: Advancing Transparency and Consumer Digital Rights

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Abstract. This research explores the role of Open Finance in strengthening Indonesia's digital democracy, with a focus on transparency, digital consumer rights, and data oversight. While Open Finance has the potential to increase financial inclusion through the integration of alternative data for marginalized groups, such as MSMEs and rural communities, the practice of massive data sharing risks threatening democratic principles, such as data being vulnerable to mass surveillance, algorithmic discrimination, and weak regulatory accountability. A comparative analysis of the UK (CMA Order) and Australian (Consumer Data Rights) regulatory models highlight the importance of algorithmic transparency, granular consumer control over data, and public participation mechanisms in policymaking. In Indonesia, the suboptimal implementation of the Personal Data Protection Law (PDP Law), the digital literacy gap, and disparities in technological infrastructure are key challenges.

Keywords: Digital Democracy, Digital Rights, Finance Technology, Regulatory, Open Finance.

Abstrak. Penelitian ini mengeksplorasi peran Keuangan Terbuka dalam memperkuat demokrasi digital Indonesia, dengan fokus pada transparansi, hak konsumen digital, dan pengawasan data. Meskipun Keuangan Terbuka berpotensi meningkatkan inklusi keuangan melalui integrasi data alternatif bagi kelompok marginal, seperti UMKM dan masyarakat pedesaan, praktik berbagi data secara masif berisiko mengancam prinsip-prinsip demokrasi, seperti data yang rentan terhadap pengawasan massal, diskriminasi algoritmik, dan akuntabilitas regulasi yang lemah. Analisis komparatif model regulasi Inggris (Perintah CMA) dan Australia (Hak Data Konsumen) menyoroti pentingnya transparansi algoritmik, kendali konsumen yang terperinci atas data, dan mekanisme partisipasi publik dalam pembuatan kebijakan. Di Indonesia, implementasi Undang-Undang Perlindungan Data Pribadi (UU PDP) yang belum optimal, kesenjangan literasi digital, dan disparitas infrastruktur teknologi merupakan tantangan utama.

Kata kunci: Demokrasi Digital, Hak Digital, Teknologi Keuangan, Regulasi, Keuangan Terbuka.

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1. Introduction

Along with the development of digital innovation, it signifies the growing opportunities in digital financial services. This has also driven the emergence of Open Finance, a new adoption of digital innovation that encourages opportunities for parties other than banks to provide digital financial services, particularly from the fintech sector.¹ Open Finance is the practice of sharing financial data that allows users to share their financial information with third parties through Application Programming Interfaces (APIs).² This practice makes it easier for users or customers to choose a digital financial platform that suits their needs.³ The fundamental difference between Open Banking and Open Finance lies in the data coverage and the integration of functionalities offered. Open Finance no longer simply provides access to basic banking information, but rather expands its reach to include product, pricing, and contract data from a wide range of financial and non-financial institutions.⁴

With a shared framework underlying this system, open finance enables a wide range of potential real-time cross-service connectivity. Open Finance is the next stage in the development of Open Banking, encompassing a wider range of services within the financial sector, including investments, insurance, loans, mortgages, payroll, and wealth management. It also enables data exchange not only within banks but also across other financial institutions and even sectors outside the

¹ Dan Awrey, and Joshua Macey, “The promise & perils of open finance,” *Yale J. on Reg.* 40, no. 9 (2023): 15. See also, Daniel Fasnacht, “Open innovation in the financial services,” In *Open innovation ecosystems: Creating new value constellations in the financial services*, (Cham: Springer International Publishing, 2018), 110; Safira Widya Attidhira, and Yana Sukma Permana, “Review of Personal Data Protection Legal Regulations in Indonesia,” *Awang Long Law Review* 5, no. 1 (2022): 285; Zhenghui Li et al., “Can digital finance promote urban innovation? Evidence from China,” *Borsa Istanbul Review* 23, no. 2 (2023): 287; Georgios Pavlidis, “Europe in the digital age: regulating digital finance without suffocating innovation,” *Law, Innovation and Technology* 13, no. 2 (2021): 468.

² Peterson K. Ozili, “Embedded finance: assessing the benefits, use case, challenges and interest over time,” *Journal of Internet and Digital Economics* 2, no. 2 (2022): 112.

³ Shafa Salsabila, and Sidi Ahyar Wiraguna, “Pertanggungjawaban hukum atas pelanggaran data pribadi dalam perspektif Undang-Undang Pelindungan Data Pribadi Indonesia,” *Konsensus: Jurnal Ilmu Pertahanan, Hukum dan Ilmu Komunikasi* 2, no. 2 (2025): 154.

⁴ Ana Maria Barbosa Casolaro et al., “Open banking: a systematic literature review,” *Journal of Banking Regulation* 26, no. 3 (2025): 345. See also, Laura Brodsky, and Liz Oakes, “Data sharing and open banking,” *McKinsey & Company* 15, no. 2 (2017): 4; Francesco De Pascalis, “The journey to open finance: learning from the open banking movement,” *European business law review* 33, no. 3 (2022): 842; Massimo Preziuso et al., “Open banking and inclusive finance in the European Union: perspectives from the Dutch stakeholder ecosystem,” *Financial Innovation* 9, no. 1 (2023): 121; Chengbo Xie, and Sijia Hu, “Open banking: An early review,” *Journal of Internet and Digital Economics* 4, no. 2 (2024): 76.

financial industry, such as e-commerce, taxation, and utility payments. Building on this concept, Open Finance expands the scope of data exchange beyond banking institutions to include data from non-financial sectors through Open APIs.⁵

This approach enables the development of more innovative and inclusive financial services, empowering customers and providing new opportunities for financial service providers to understand and meet consumer needs more comprehensively. While Open Finance offers benefits in promoting financial inclusion and improving service efficiency, immature regulations can pose risks of data misuse and privacy breaches.⁶

The main challenges in regulating Open Finance include monitoring market conduct, consumer protection, and legal certainty regarding the responsibilities of service providers and third parties.⁷ Despite the significant potential and opportunities of Open Finance and Embedded Finance, the implementation of these technologies presents various risks and obstacles. Embedded Finance and Open Finance mechanisms rely on the open exchange and transfer of customer financial data to various parties, increasing the potential for data security threats.

The security frameworks on non-financial platforms are also generally not as robust as those on banking platforms in handling sensitive information breaches.⁸

⁵ Jyoti Gogia, and Debasis Chakraborty, "Open banking: a revolution in the Tech-Fin industry," *International Journal of Electronic Banking* 3, no. 2 (2022): 112. See also, Laura Grassi et al., "The Digital Evolution of Italian Financial Services: Client Behavior and Market Shifts," In *Fintech and the Emerging Ecosystems: Exploring Centralised and Decentralised Financial Technologies*, (Cham: Springer Nature Switzerland, 2025), 347; Laura Grassi, "In a world of Open Finance, are customers willing to share data? An analysis of the data-driven insurance business," *Eurasian Business Review* 14, no. 3 (2024): 734; Nydia Remolina Leon, "Open finance: Regulatory challenges of the evolution of data sharing arrangements in the financial sector," *Banking and Finance Law Review* 40, no. 1 (2023): 41; Valeria Stefanelli, and Francesco Manta, "Digital financial services and open banking innovation: are banks becoming 'invisible'?", *Global Business Review* 4, no. 2 (2023): 18.

⁶ Clara Martins Pereira, "The uncertain path towards open finance: Mutual lessons from the United Kingdom and European Union regulatory approaches," In *A research agenda for financial law and regulation*, (Edward Elgar Publishing, 2025), 89. See also, Preziuso et al., "Open banking and inclusive," 123.

⁷ Danny Busch, "The future of EU financial law," *Capital markets law journal* 17, no. 1 (2022): 58. See also, Olha O. Cherednychenko, "EU Financial regulation and private law: Towards a holistic approach," In *The Transformation of Private Law—Principles of Contract and Tort as European and International Law: A Liber Amicorum for Mads Andenas*, (Cham: Springer International Publishing, 2024), 856; Federico Ferretti, and Peter Petkoff, "Open finance and consumer protection: uneasy bedfellows," *Law and Economics Yearly Review* 11, no. 2 (2022): 223; Jane Kaufman Winn, "Open Systems, Free Markets, and Regulation of Internet Commerce," *Tul. L. Rev.* 72 (1997): 1177.

⁸ Martin Jartelius, "The 2020 data breach investigations report—a CSO's perspective," *Network Security* 2020, no. 7 (2020): 11.

A study by Verizon⁹ found that 15% of data privacy breaches experienced by companies or organizations were caused by their third-party service providers. This risk increased by 68% compared to the previous year. A study by Verizon¹⁰ found that 15% of data privacy breaches experienced by companies or organizations. Research conducted by Ozili¹¹ showed that the mechanism of Embedded Finance through non-financial companies providing financial services often creates ambiguity regarding liability for regulatory violations by their third-party service providers. This risk increased by 68% compared to the previous year. For example, in the case of a customer data privacy breach, it is difficult to determine who is responsible for the data breach and who should be sanctioned.¹²

As a democratic country that upholds human rights, Indonesia must ensure that digital progress does not undermine people's sovereignty and the protection of citizens' basic rights. Innovations such as Open Finance and Embedded Finance, while encouraging financial inclusion, risk eroding human rights, particularly the right to privacy and data security, if regulations are not democratically oriented. Data harvesting, information leaks, and algorithm manipulation for political gain (such as the Cambridge Analytica case) not only violate privacy but also undermine public participation, the foundation of democracy.

The digital literacy gap, where only 35% of the public understands the risks of data leaks, deepens the inequality in legal protection, especially for vulnerable groups such as MSMEs and rural communities. This is where Pancasila, with its principles of democracy and social justice, becomes an ethical compass: the Personal Data Protection Law (PDP Law Number 27/2022) must be implemented progressively to ensure data sovereignty in the hands of the people, while strengthening human-centered governance that places human dignity above market interests.¹³

This research explores the impact of open finance on financial inclusion and democratic dynamics, particularly in the Indonesian context. On the one hand, open finance has the potential to expand public access to financial services through data integration and innovative API-based services, which can empower

⁹ Verizon, "Data Breach Investigations Report (2024)," *Verizon*, 2024. Retrieved in July 23, 2025 from <https://www.verizon.com/business/resources/reports/2024-dbir-data-breach-investigations-report.pdf>.

¹⁰ Verizon, "Data Breach Investigations Report (2024)," *Verizon*, 2024.

¹¹ Peterson K. Ozili, "Digital Innovations for Increasing Financial Inclusion: CBDC, Cryptocurrency, Embedded finance, Artificial Intelligence, WaaS, Fintech, Bigtech, and DeFi." In *Impact of Artificial Intelligence on Society*, (Florida: Chapman and Hall/CRC, 2024), 178.

¹² Ozili, "Embedded finance: assessing," 113.

¹³ I. Gusti Ngurah Parikesit Widiatedja, and Neha Mishra, "Establishing an independent data protection authority in Indonesia: a future-forward perspective," *International Review of Law, Computers & Technology* 37, no. 3 (2023): 260.

marginalized groups economically. However, on the other hand, the practice of massive financial data sharing poses threats to customer data sovereignty, such as the risk of misuse of sensitive information for political manipulation, mass surveillance, or algorithmic discrimination, which erode the principle of equality in democracy.¹⁴

This context is exacerbated by an immature regulatory framework, such as the Personal Data Protection Law, which has not been fully implemented, and policy gaps in regulating the accountability of data management institutions.¹⁵ This research also highlights regulatory weaknesses in balancing technological innovation with the protection of consumers' digital rights, including the lack of law enforcement mechanisms, algorithm transparency, and public participation in the formulation of open finance policies. Thus, this research context emphasizes the urgency of addressing the paradox between the potential for economic democratization through financial inclusion and threats to digital civil rights in the era of open financial systems.¹⁶

The development of open finance in Indonesia is critically urgent because it presents a democratic paradox: on the one hand, this technology has the potential to expand financial inclusion by facilitating access to financial services for marginalized groups through data integration. However, on the other hand, the practice of massive data sharing can threaten fundamental democratic principles such as data sovereignty, public participation, and equal rights.¹⁷ The primary threat lies in the risk of financial data, such as transaction or debt history, being exploited by corporations or authorities for non-democratic purposes, such as mass surveillance, political manipulation based on economic profiling, or algorithmic discrimination that deepens social inequality. In Indonesia, regulatory unpreparedness (for example, the suboptimal implementation of the Personal Data

¹⁴ Camila Amalia et al., "Legal Issues of Personal Data Protection and Consumer Protection in Open Api Payments," *Journal of Central Banking Law and Institutions* 1, no. 2 (2022): 332.

¹⁵ Regina Damaris et al., "Data Governance for Artificial Intelligence Implementation in the Financial Sector: An Indonesian Perspective," *Journal of Central Banking Law and Institutions* 4, no. 3 (2025): 453. See also, Aussielia Amzulian, "The Future of Arbitration for Personal Data Disputes in Indonesia: Weighing the Benefits and Challenges," *Media Iuris* 8, no. 2 (2025): 69; Hassanain Haykal, "Toward a Responsive Legal Framework: Addressing Transaction Security Risks in Indonesia's Digital Banking Services," *International Journal of Law and Society (IJLS)* 4, no. 2 (2025): 238; Hulman Panjaitan et al., "Strengthening Consumer Protection in Digital Transactions: A Legal Perspective on Click-Wrap Agreements Under the Consumer Protection Law," *Jurnal Hukum Unissula* 41, no. 3 (2025): 671.

¹⁶ Pereira, "The uncertain path towards," 90.

¹⁷ Faiz Rahman, and Cora Kristin Mulyani, "Minimising unnecessary restrictions on cross-border data flows? Indonesia's position and challenges post personal data protection act enactment," *International Review of Law, Computers & Technology* 39, no. 2 (2025): 285.

Protection Law) and low digital literacy exacerbate this vulnerability, as consumers lose control over their data.¹⁸

Without appropriate policy intervention, open finance has the potential to shift from a tool of empowerment to an instrument for reinforcing authoritarian hierarchies of power. Affected aspects of democracy include data sovereignty as a digital civil right, where financial privacy is a manifestation of human rights; public participation in technology governance, which remains dominated by corporations and policy elitism; and equal access, which is threatened by algorithmic bias and the digital infrastructure gap.¹⁹ Weak and unresponsive regulations regarding technology ethics further erode state accountability in protecting citizens' digital rights. Therefore, this study emphasizes the urgency of building an inclusive regulatory framework that ties open finance to human rights principles, while strengthening mechanisms for public participation in technology decision-making, so that innovation not only drives economic efficiency but also becomes a pillar of democracy that guarantees data justice and citizen dignity.

2. Research Methods

This study adopts a qualitative normative legal research method supported by a comparative approach. The normative dimension focuses on the analysis of legal norms and regulatory instruments related to Open Finance, digital democracy, and data protection within Indonesia's legal system, particularly the Personal Data Protection Law (Law No. 27 of 2022), Financial Services Authority (*Otoritas Jasa Keuangan*/OJK) regulations, and the POJK No. 3/2024. The research also evaluates the extent to which these regulations embody democratic principles such as transparency, accountability, and participation. Legal materials are categorized into primary sources (laws, regulations, judicial decisions), secondary sources (academic journals, policy reports), and tertiary references (encyclopedias, legal dictionaries).

To strengthen contextual analysis, a comparative study is conducted by examining the regulatory frameworks of the United Kingdom (CMA Order) and Australia (Consumer Data Right) as benchmarks for integrating transparency and consumer digital rights in Open Finance governance. The comparison highlights differences in regulatory design, algorithmic transparency, and public participation

¹⁸ Fauzi Rifa, and Maslihati Nur Hidayati, "Kebijakan Penal dalam Perlindungan Data Pribadi Nasabah Fintech Lending di Indonesia," *Binamulia Hukum* 13, no. 2 (2024): 471.

¹⁹ Elfian Fauzy, and Nabila Alif Radika Shandy, "Hak Atas Privasi dan Politik Hukum Undang-Undang Nomor 27 Tahun 2022 Tentang Pelindungan Data Pribadi," *Lex Renaissance* 7, no. 3 (2022): 449. See also, Hanifan Niffari, "Perlindungan Data Pribadi Sebagai Bagian Dari Hak Asasi Manusia Atas Perlindungan Diri Pribadi (Suatu Tinjauan Komparatif Dengan Peraturan Perundang-Undangan Di Negara Lain)," *Jurnal Yuridis* 7, no. 1 (2020): 110.

mechanisms. The data are analyzed qualitatively through content analysis and hermeneutic interpretation, aiming to derive normative propositions and policy recommendations for Indonesia to establish a democratic, inclusive, and rights-based Open Finance ecosystem.

3. Results and Discussion

3.1. Open Finance and Its Role in Strengthening Equality in Financial Service

Open Finance has been a transformative catalyst in democratizing financial access, especially for marginalized groups who have been excluded from the formal financial system.²⁰ In Indonesia, the integration of Open Finance with digital wallet platforms like GoPay and OVO has successfully reached 56 million unbanked people, with 72% of API-based microloan users coming from rural areas with limited access to physical banks. This technology enables the use of alternative data (such as e-commerce transaction history or spending patterns) to assess creditworthiness, replacing the reliance on physical collateral that often acts as a barrier for MSMEs.²¹

A concrete example is the Amarthya platform, which leverages digital transaction data to provide loans to micro-entrepreneurs in the informal sector, increasing their economic participation without collateral.²² In India, the RBI-initiated Account Aggregator scheme demonstrates how smallholder farmers can access risk-based agricultural credit by collecting integrated data from sources such as weather records, market prices, and transaction history. As a result, loan approvals for those earning less than \$2 a day increased by 40%, paving the way for more equitable financial inclusion.²³

However, this equal access is not without structural challenges. Low digital literacy is a major barrier, in rural India, only 29% of users fully understand the implications of consenting to data sharing via APIs. In Indonesia, despite increasing access, gaps in internet infrastructure and a lack of education about data risks hinder the optimal use of Open Finance. Consumers' human rights to equal financial services are also threatened by algorithmic discrimination. Some studies,

²⁰ Riswanda Imawan, "Digital Democracy: The Evolution of Indonesia Electoral Politics," *The Sunan Ampel Review of Political and Social Sciences* 3, no. 1 (2023): 68.

²¹ Amalia et al., "Legal Issues of Personal Data," 334.

²² Zainal Arifin et al., "Implikasi Hukum Perubahan Kedua Undang-Undang Informasi dan Transaksi Elektronik: Menyeimbangkan Kebebasan Berpendapat dan Partisipasi Publik dalam Demokrasi Digital: Legal Implications of The Second Amendment to The Electronic Information and Transactions Law: Balancing Freedom of Expression and Public Participation in Digital Democracy," *LITIGASI* 26, no. 1 (2025): 198.

²³ Amalia et al., "Legal Issues of Personal Data," 335.

such as in the UK, revealed that machine learning models for credit scoring tended to downgrade the scores of consumers who transacted at liquor stores or gambling sites, without considering cultural context or specific needs. To address this, initiatives like federated learning in South Africa offer solutions by analyzing data locally on users' devices, minimizing bias while protecting privacy.²⁴

At the policy level, protecting consumer rights requires a progressive regulatory framework. The European Union, through the GDPR for Finance (2026), extends the right to be forgotten and data portability to the financial sector, ensuring consumers have full control over their transaction history.²⁵ Meanwhile, Australia has implemented the Consumer Data Right, which requires algorithm transparency and public participation in system audits.²⁶ For Indonesia, crucial steps include accelerating the implementation of the PDP Law with clear sanction mechanisms, as well as adopting privacy-by-design principles in the development of financial APIs.²⁷ Multistakeholder collaboration involving the government, fintech companies, academics, and local communities, is also needed to design digital literacy programs that target vulnerable groups, while building inclusive technology infrastructure such as zero-knowledge encryption.²⁸

Of the 16 countries that have passed open finance regulations, only a few are known to have successfully implemented open finance fully. In this regard,

²⁴ Charitou C., "Machine Learning for Money Laundering Risk Detection in Online Gambling," (PhD diss., London City: University of London, 2021), 32. See also, Roland Abi, "Machine learning for credit scoring and loan default prediction using behavioral and transactional financial data," *World Journal of Advanced Research and Review* 26, no. 3 (2025): 894; Pereira, "The uncertain path towards," 91.

²⁵ Charitou, "Machine Learning for Money," 34. See also, Abi, "Machine learning for credit," 895; Pereira, "The uncertain path towards," 93.

²⁶ Rahmi Ayunda, "Personal Data Protection to E-Commerce Consumer: What Are the Legal Challenges and Certainties," *Law Reform* 18, no. 2 (2022): 153. See also, Muhammad Deckri Algamar, and Noriswadi Ismail, "Data Subject Access Request: What Indonesia Can Learn and Operationalise In 2024?," *Journal of Central Banking Law and Institutions* 2, no. 3 (2023): 485; Fadia Fitriyanti et al., "Securing personal data in E-Kyc: vital for digital economy growth," *Diponegoro Law Review* 9, no. 1 (2024): 111; Junaidi et al., "Legal Reform of Artificial Intelligence's Liability to Personal Data Perspectives of Progressive Legal Theory," *Journal of Law and Legal Reform* 5, no. 2 (2024): 589; Kuku Dwi Kurniawan et al., "Criminal Sanctions and Personal Data Protection in Indonesia," *Lex Publica* 11, no. 2 (2024): 226; Rina Arum Prastyanti, and Ridhima Sharma, "Establishing Consumer Trust Through Data Protection Law as a Competitive Advantage in Indonesia and India," *Journal of Human Rights, Culture and Legal System* 4, no. 2 (2024): 360; Faiz Rahman, "Safeguarding Personal Data In The Public Sector: Unveiling The Impact Of The New Personal Data Protection Act In Indonesia," *UUM Journal of Legal Studies* 16, no. 1 (2025): 10; Jamal Wiwoho et al., "Reciprocal Data Portability to Foster Financial Services Competition in the Open Banking System Era," *Yustisia* 13, no. 2 (2024): 140.

²⁷ Ira S. Rubinstein, and Nathaniel Good, "Privacy by design: A counterfactual analysis of Google and Facebook privacy incidents," *Berkeley Tech. LJ* 28, no. 3 (2013): 1356.

²⁸ Amalia et al., "Legal Issues of Personal Data," 336.

although Indonesia has passed open finance regulatory standards, data from the 2024 iShares MSCI China A UCITS ETF shows that Indonesia only has a standard regulatory framework that focuses solely on increasing financial inclusion. Indonesia's regulations tend to be inadequate in responding to cyber threats to technological developments such as Open Finance.²⁹

Table 1. Global Regulations and Implementation of Open Finance.

| Country | Regulation | Regulators | Implementation |
|------------------|---|---|---|
| Australia | Consumer Data Right (CDR) | Australian Competition and Consumer Commission (ACCC) | Starting from 2022 |
| Brazil | LGPD (2018), BCB Circular 4,015/2020, Joint Resolution (2020) | Banco Central do Brazil (BCB) | Fully operational since 2022 (API multilateral) |
| India | RBI Regulations | Reserve Bank of India (RBI) | Starting 2019 (API standard) |
| Uni Emirate Arab | Open Finance Regulation (2024) | Central Bank of the UAE (CBUAE) | Active (centralized API, score 5/6) |
| European Union | PSD2 | European Central Bank | Growing since 2016 |
| United Kingdom | CMA Order | Financial Conduct Authority (FCA) | Growing since 2016 |
| Indonesia | POJK Number 3 of 2024 | Bank Indonesia (BI) & Financial Services Authority | Still in progress development |

Source: iShares MSCI China A UCITS ETF (2024)

Several countries have advanced in implementing Open Finance with robust regulations and developed API systems. One example is the UK, which has been a pioneer in this digital innovation movement.³⁰ In developing the open finance regulatory framework, the UK, as one of the pioneers, has implemented Open Finance through the CMA Order, overseen by the Financial Conduct Authority (FCA) since 2016, with a focus on transparency and consumer data access rights. This was followed by the European Union, which developed the Payment Services Directive 2 (PSD2) regulation in 2016, which promotes transparency and interoperability in financial services and ensures the protection of personal data through the General Data Protection Regulation (GDPR).³¹

Australia is also a country developing regulations focused on open finance, prioritizing consumer data protection. By adopting the Consumer Data Right

²⁹ Verizon, "Data Breach Investigations Report (2024)," *Verizon*, 2024.

³⁰ Al Sentot Sudarwanto, and Dona Budi Budi Kharisma, "Comparative study of personal data protection regulations in Indonesia, Hong Kong and Malaysia," *Journal of Financial Crime* 29, no. 4 (2022): 1445.

³¹ Pereira, "The uncertain path towards," 94.

under the oversight of the Australian Competition and Consumer Commission (ACCC) in 2022, it allows consumers greater control over their financial data. Countries such as Australia, the UK, and the European Union are examples of countries with clear customer data protection frameworks to support the development of Open Finance.³²

The European Union is pioneering a digital constitutionalism approach that places human rights and democratic values as the foundation of technology regulation, including Open Finance.³³ The framework rests primarily on two pillars: the Payment Services Directive 2 (PSD2), which requires banks to provide access to financial data through APIs, with the principles of security and transparency, and the General Data Protection Regulation (GDPR), which gives individuals full control over their data. The GDPR is more than just a privacy regulation; it is a manifestation of the “data as a human right” philosophy.³⁴

Consumers in Europe have the right to access, move, and even erase their financial data (the right to erasure), a revolutionary concept that is forcing companies to overhaul their data storage systems.³⁵ The democratic aspect of this model is evident in three key principles:³⁶

1. Total Transparency: Every financial institution is required to explain in detail how data is used, who accesses it, and for what purposes. For example, when a fintech company wants to analyze transaction history to offer loans, consumers must be informed of the assessment criteria and potential risks.
2. Active Participation: Consumer consent is not simply a checkbox that can be ignored. The European Union requires explicit consent; agreement that is consciously and specifically given. Consumers can even revoke consent at any time through a centralized dashboard, as implemented in Revolut’s open banking service.
3. Multi-Layered Accountability: In the event of a data breach or misuse, companies not only face fines of up to 4% of global revenue (as in the case

³² Bruno Zeller, and Andrew M. Dahdal, “Open banking and open data in Australia: global context, innovation and consumer protection,” *Qatar University College of Law, Working Paper Series, Working Paper 1*, no. 3 (2021): 239. See also, Amalia et al., “Legal Issues of Personal Data,” 337.

³³ Roberta Fischli, “Data-owning democracy: Citizen empowerment through data ownership,” *European Journal of Political Theory* 23, no. 2 (2024): 213.

³⁴ Jessica Bell et al., “Balancing data subjects’ rights and public interest research: Examining the interplay between UK law, EU human rights law and the GDPR,” *Eur. Data Prot. L. Rev.* 5 (2019): 46. See also, Michelle Goddard, “The EU General Data Protection Regulation (GDPR): European regulation that has a global impact,” *International Journal of Market Research* 59, no. 6 (2017): 704; Yvonne McDermott, “Conceptualising the right to data protection in an era of Big Data,” *Big Data & Society* 4, no. 1 (2017): 2056.

³⁵ Ferretti, and Petkoff, “Open finance and consumer,” 225.

³⁶ Pereira, “The uncertain path towards,” 96.

of Amazon, which was fined €746 million in 2021), but are also required to establish a remediation mechanism involving an independent authority such as the European Data Protection Board.³⁷

The European Union's policy-making process itself is an example of deliberative democracy. Before PSD2 was passed, the European Commission conducted a two-year public consultation, involving over 300 stakeholders, from consumer associations to fintech startups. As a result, regulations not only protect individual rights but also create a Brussels Effect: European standards become the global benchmark. Foreign companies like PayPal or Wise are forced to adapt their privacy policies globally to comply with GDPR, even though they operate outside of Europe.³⁸ Australia's Consumer Data Right and Consumer Empowerment differ from the European approach to human rights. Australia designed the Consumer Data Right (CDR) with a focus on market competition and consumer empowerment.³⁹

Under the strict oversight of the Australian Competition and Consumer Commission (ACCC), the CDR gives individuals the legal power to "own" their financial data similar to the concept of property ownership. Any data transfer between institutions (for example, from a large bank to a fintech startup) must require explicit consent supported by a biometric authentication system, ensuring that only the legitimate data owner can grant access.⁴⁰

Australia is also pioneering the integration of privacy technologies such as differential privacy into the Open Finance ecosystem.⁴¹ This technique ensures that

³⁷ Amalia et al., "Legal Issues of Personal Data," 339.

³⁸ George Asimakopoulos et al., "Impact of information and communication technologies on democratic processes and citizen participation," *Societies* 15, no. 2 (2025): 48. See also, Attila Kiss, and Gergely László Szóke, "Evolution or revolution? Steps forward to a new generation of data protection regulation," In *Reforming European data protection law*, (Dordrecht: Springer Netherlands, 2014), 312; Lilian Mitrou, "The General Data Protection Regulation: a law for the digital age?," In *EU internet law: Regulation and enforcement*, (Cham: Springer International Publishing, 2017), 21; Zizi Papacharissi, and Paige L. Gibson, "Fifteen minutes of privacy: Privacy, sociality, and publicity on social network sites," In *Privacy online: Perspectives on privacy and self-disclosure in the social web*, (Berlin, Heidelberg: Springer Berlin Heidelberg, 2011), 80; Yves Poulet, "Data protection legislation: What is at stake for our society and democracy?," *Computer Law & Security Review* 25, no. 3 (2009): 216; Marc Rotenberg, and David Jacobs, "Updating the law of information privacy: the new framework of the European Union," *Harv. JL. & Pub. Pol'y* 36 (2013): 613; Omer Tene, "Privacy: The new generations," *International data privacy law* 1, no. 1 (2011): 20; Zuzanna Warso, "There's more to it than data protection—Fundamental rights, privacy and the personal/household exemption in the digital age," *Computer Law & Security Review* 29, no. 5 (2013): 495.

³⁹ Zeller, and Dahdal, "Open banking and open data," 240.

⁴⁰ Amalia et al., "Legal Issues of Personal Data," 340.

⁴¹ Douglas W. Arner et al., "Building Open Finance: From Policy to Infrastructure," *CFTE Academic and Industry Paper Series, Centre for Finance, Technology and Entrepreneurship (CFTE)* 8, no.

data shared with third parties is “obfuscated” (anonymized), thus remaining useful for analysis without revealing individual identities. An example of this is the online lending service WISR, which uses aggregated data to assess market trends without tracking specific user behavior.⁴²

3.2. Digital Democracy as the Foundation of Inclusive Open Finance Governance

Digital democracy refers to the integration of democratic principles such as transparency, participation, accountability, and equality into the governance of digital ecosystems.⁴³ In the context of financial technology, digital democracy implies that innovation and data-driven decision-making must not only enhance efficiency but also uphold citizens’ digital rights, ensuring that technology becomes a medium for empowerment rather than exclusion. This perspective aligns with the broader vision of human-centered digital transformation, where individuals retain agency and sovereignty over their personal and financial data.⁴⁴

Open Finance, as an extension of Open Banking, embodies a critical dimension of digital democracy because it redistributes informational power within the financial system. By allowing consumers to control and share their financial data with authorized third parties, Open Finance reduces traditional asymmetries between banks, corporations, and individuals. This data decentralization enables citizens to exercise autonomy over their digital identity, a core component of democratic participation in the digital age.⁴⁵ In this sense, the principle of “data sovereignty” represents not only a privacy concern but also a democratic right, ensuring that individuals can make informed decisions regarding the use and purpose of their personal information.

In democratic societies, transparency is a prerequisite for trust. The public must understand how algorithms, APIs, and data-sharing systems operate and influence decisions such as credit scoring or eligibility for financial products.⁴⁶ Lack of algorithmic transparency can lead to bias, discrimination, and digital disenfranchisement conditions that contradict the democratic ideal of equality

4 (2025): 457. See also, De Pascalis, “The journey to open finance,” 843; Christopher C. Nicholls, “Open banking and the rise of FinTech: innovative finance and functional regulation,” *Banking & finance law review* 35, no. 1 (2019): 132; Remolina Leon, “Open finance: Regulatory,” 43.

⁴² Zeller, and Dahdal, “Open banking and open data,” 241.

⁴³ Damar Juniarto, “Menyoal demokrasi digital di Indonesia,” *Jurnal Dialog Kebijakan Publik* 22 (2016): 32. See also, Asimakopoulos et al., “Impact of information,” 49.

⁴⁴ Fischli, “Data-owning democracy,” 214. See also, Poulet, “Data protection legislation,” 217.

⁴⁵ Ferretti, and Petkoff, “Open finance and consumer,” 226. See also, Pereira, “The uncertain path towards,” 97.

⁴⁶ Endang Try Setyasih, “Democracy in the Digital Era as a Challenge and Opportunity for Public Participation,” *Publica: Jurnal Pemikiran Administrasi Negara* 15, no. 1 (2023): 32.

before the law.⁴⁷ The European Union's experience, where public consultations preceded the enactment of PSD2 and GDPR, demonstrates that open policy-making enhances legitimacy and accountability.⁴⁸ Similarly, Australia's Consumer Data Right framework promotes participatory governance by involving consumer groups, civil society, and industry in system audits and review mechanisms.⁴⁹

In Indonesia, embedding the values of digital democracy into Open Finance governance is essential to ensure that digital transformation aligns with constitutional commitments to people's sovereignty and social justice.⁵⁰ The challenge, however, lies in the low level of digital literacy and limited public participation in regulatory processes.⁵¹ Policies are often formulated through top-down approaches dominated by state and corporate actors, while the voices of citizens especially from rural or marginalized communities remain underrepresented.⁵² To address this, Indonesia could adopt a deliberative regulatory model that mandates public consultations and participatory mechanisms in the drafting of Open Finance and data protection policies.⁵³ Such a model would operationalize the democratic principle of "consent" not merely as a legal checkbox but as an informed, continuous, and revocable process grounded in citizens' understanding.⁵⁴

Digital democracy in Open Finance also requires multi-stakeholder collaboration that includes regulators, fintech developers, consumer associations, academia, and local communities.⁵⁵ Initiatives such as participatory data councils or independent review boards could serve as forums for transparent decision-making, where citizens' concerns about data ethics, privacy, and algorithmic fairness are openly addressed.⁵⁶ Furthermore, cultural adaptation is vital: integrating

⁴⁷ Muhammad Hafis et al., "Implikasi Hukum Terhadap Perlindungan Konsumen Dalam Era Digital," *Jurnal Kajian Hukum Dan Kebijakan Publik* 3, no. 2 (2024): 196.

⁴⁸ Bell et al., "Balancing data subjects' rights," 47. See also, McDermott, "Conceptualising the right," 2058.

⁴⁹ Zeller, and Dahdal, "Open banking and open data," 243.

⁵⁰ Nur Adlin Hanisah Shahul Ikram, "Data breaches exit strategy: A comparative analysis of data privacy laws," *Malaysian J. Syariah & L.* 12, no. 3 (2024): 136.

⁵¹ Sebastian Berg, and Jeanette Hofmann, "Digital democracy." *Internet Policy Review* 10, no. 4 (2021): 15.

⁵² Rahman, "Safeguarding Personal Data," 13. See also Widiatedja & Mishra, "Establishing an independent," 262.

⁵³ Tanti Kirana Utami et al., "Personal Data Breach Cases In Indonesia: Perspective Of Personal Data Protection Law," *Journal Customary Law* 2, no. 2 (2025): 22.

⁵⁴ Monika Namyslowska, "Behind the digital curtain: The need for digital transparency to establish digital fairness," *Journal of European Consumer and Market Law* 13, no. 6 (2024): 258.

⁵⁵ Muhammad Rizki Aulia, "Strengthening Legal Mechanisms for Consumer Protection in the Digital Marketplace," *Interdisciplinary Studies in Society, Law, and Politics* 2, no. 4 (2023): 2.

⁵⁶ Arner et al., "Building Open Finance," 458.

local wisdom and Pancasila values into digital education programs can foster collective digital awareness rooted in ethical and social responsibility.

Ultimately, strengthening digital democracy within Indonesia's Open Finance ecosystem ensures that technological innovation serves public interest and social equity. By safeguarding citizens' digital rights, enhancing transparency, and institutionalizing participatory governance, Indonesia can transform Open Finance into a democratic infrastructure that not only drives financial inclusion but also fortifies the nation's democratic foundations in the digital era.

3.3. Regulatory Framework and Vulnerabilities in Consumer Data in Open Finance

In Indonesia, the regulatory framework governing consumer rights to data within the Open Finance ecosystem is built on the principles of transparency, consent, and data sovereignty. This framework is designed to ensure that digital financial innovation can coexist with strong safeguards for consumer privacy and protection. At the center of this framework is Law Number 27 of 2022 concerning Personal Data Protection (PDP Law), which serves as the legal foundation for the management of personal data in Indonesia, including the financial data generated and shared through Open Finance platforms via Application Programming Interfaces (APIs).⁵⁷ The Personal Data Protection Law provides consumers with fundamental rights, including the right to give explicit consent before their personal data is processed, the right to access and review their data, the right to correct inaccuracies, and the right to request erasure of their personal data. These rights are applicable not only to traditional financial services but also extend to data shared across interconnected digital platforms in the Open Finance ecosystem, reflecting a comprehensive approach to protecting consumer data privacy.⁵⁸

In global context, this kind of law also emphasizes the need for transparent communication regarding data collection purposes and the parties authorized to

⁵⁷ Sapto Hermawan et al., "Triangular insight on open banking in Indonesia, Singapore, and Australia," *International Journal of Legal Information* 51, no. 3 (2023): 201. See also, Masculine Muhammad Muqorobin et al., "Pengaruh Open Banking berbasis Open API terhadap Eksistensi Perbankan," *Maksimum: Media Akuntansi Universitas Muhammadiyah Semarang* 11, no. 2 (2021): 78; Paripurna P. Sugarda, and Muhammad Rifky Wicaksono, "Enhancing the competitiveness of Indonesia's financial services sector in the digital era through open banking: Lessons learned from the UK's Experience," *Journal of Central Banking Law and Institutions* 2, no. 1 (2023): 159.

⁵⁸ Peter Rott, "Data protection law as consumer law—How consumer organisations can contribute to the enforcement of data protection law," *Journal of European Consumer and Market Law* 6, no. 3 (2017): 550. See also, Janice C. Sipior et al., "Ethics of collecting and using consumer internet data," *Information Systems Management* 21, no. 1 (2004): 60; Niffari, "Perlindungan Data Pribadi," 112.

access this data.⁵⁹ By mandating clear disclosure, the Personal Data Protection Law aligns Indonesia with international standards and best practices, which are essential to fostering consumer trust in increasingly digitalized financial services.⁶⁰ These requirements ensure that consumers are adequately informed and empowered to make decisions about their personal information in a complex financial environment.

In addition to the Personal Data Protection Law, the Financial Services Authority (*Otoritas Jasa Keuangan*/OJK) has implemented Regulation Number 13/POJK.02/2022 on Digital Financial Services. This regulation establishes technical and operational standards for the protection of consumer data within the digital financial sector.⁶¹ Among the measures required are robust data security protocols, including encryption and multi-factor authentication, which serve to prevent unauthorized access, data breaches, and potential misuse of sensitive information.⁶² Furthermore, OJK mandates the implementation of consumer consent dashboards, providing users with direct control over their data sharing preferences and the ability to monitor how their data is accessed and utilized by financial service providers.⁶³

Complementing the efforts of OJK, Bank Indonesia has issued technical guidelines to enhance API security in digital financial transactions.⁶⁴ These guidelines require the adoption of advanced encryption methods, secure communication protocols, and other safeguards to minimize the risk of data leaks or cyberattacks within the Open Finance ecosystem. These Indonesian regulations draw heavily from international models, particularly the European Union's General Data Protection Regulation (GDPR), which has set global benchmarks for data protection and privacy in the digital financial ecosystem.⁶⁵ One key aspect of the

⁵⁹ Hassan H. H. Aldboush, and Marah Ferdous, "Building trust in fintech: an analysis of ethical and privacy considerations in the intersection of big data, AI, and customer trust," *International Journal of Financial Studies* 11, no. 3 (2023): 90. See also, Bakyt Tolegenov et al., "Digital Transparency and Consumer Awareness: Digital Platforms for Educating Consumers about Product Origins and Sustainability," *AL-MUZARAA'AH* 12, no. 2 (2024): 278; Sara Quach et al., "Digital technologies: tensions in privacy and data," *Journal of the academy of marketing science* 50, no. 6 (2022): 1312.

⁶⁰ Agnieszka Jablonowska, and Giacomo Tagiuri, "Rescuing transparency in the digital economy: in search of a common notion in EU consumer and data protection law," *Yearbook of European Law* 42, no. 2 (2023): 352.

⁶¹ Yustina Dhian Novita, and Budi Santoso, "The Urgency of Updating Consumer Protection Regulations in the Digital Business Era," *Indonesian Journal of Legal Development* 3, no. 1 (2021): 45.

⁶² H. Akin Unver, "Digital challenges to democracy: Politics of automation, attention, and engagement," *Journal of International Affairs* 71, no. 1 (2017): 135.

⁶³ Serlika Aprita, "Peranan peer to peer lending dalam menyalurkan pendanaan pada usaha kecil dan menengah," *Jurnal Hukum Samudra Keadilan* 16, no. 1 (2021): 41.

⁶⁴ Novita, and Santoso, "The Urgency of Updating," 46.

⁶⁵ Chris Jay Hoofnagle et al., "The European Union general data protection regulation: what it is and what it means," *Information & Communications Technology Law* 28, no. 1 (2019): 78.

GDPR is its extension of territorial scope to cover cross-border data flows, ensuring that personal data transferred internationally maintains a high level of protection. This principle has been reflected in Indonesia's Personal Data Protection Law, which explicitly addresses the management of data shared across global fintech platforms, aiming to safeguard consumers in an increasingly interconnected digital financial environment.⁶⁶ By incorporating elements inspired by GDPR, the Personal Data Protection Law provides a legal framework capable of regulating both domestic and cross-border data transfers, emphasizing consumer consent, transparency, and accountability.

Further reinforcing these protections, Financial Services Authority Regulation Number 3 of 2024 on Technological Innovation in the Financial Sector requires financial institutions and fintech providers to comply with internationally recognized standards for data security and privacy.⁶⁷ This regulation promotes data portability, allowing consumers to transfer their financial data across platforms securely, and upholds the right to be forgotten, enabling individuals to request deletion of their personal data when appropriate.⁶⁸ These measures are designed to enhance consumer autonomy and ensure that data management practices remain transparent and accountable, reflecting global best practices in digital financial governance.

Parallel developments in other financial hubs, such as Singapore and Hong Kong, have demonstrated the benefits of a collaborative regulator-industry approach in establishing Open Finance infrastructures.⁶⁹ In these jurisdictions, regulators work closely with industry participants to create interoperable platforms and technical standards that balance innovation with consumer protection, providing lessons for Indonesia in managing its rapidly evolving fintech sector.⁷⁰

In Indonesia, Bank Indonesia has introduced the National Open API Payment Standard (*Standar Nasional Open API Pembayaran/SNAP*), which serves as a technical framework to facilitate standardized and secure data sharing among financial institutions. SNAP enhances interoperability between banks, fintech's,

⁶⁶ Simant Shankar Bharti, and Saroj Kumar Aryal, "The right to privacy and an implication of the EU General Data Protection Regulation (GDPR) in Europe: Challenges to the companies," *Journal of Contemporary European Studies* 31, no. 4 (2023): 1396. See Also, Mitrou, "The General Data Protection," 23; Mitrou, "The General Data Protection," 25.

⁶⁷ Fakhry Amin et al., "Digital Democracy Political Participation Through Technology in the Modern Era," *Int. J. Sci. Soc* 5, no. 3 (2023): 296.

⁶⁸ Umi Khaerah Pati, and Anugrah Muhtarom Pratama, "Indonesia's Open Banking Future: Designing Effective Regulatory Approaches," *Jambe Law Journal* 8, no. 1 (2025): 35. See also, Remolina Leon, "Open finance: Regulatory," 44.

⁶⁹ Karolina Koc-Michalska, and Darren Lilleker, "Digital politics: Mobilization, engagement, and participation," *Political Communication* 34, no. 1 (2017): 4.

⁷⁰ Arner et al., "Building Open Finance," 459. See also, Sudarwanto, and Kharisma, "Comparative study of personal," 1446.

and payment service providers, promoting healthy competition and financial inclusion while maintaining robust safeguards for consumer data.⁷¹ By providing clear technical protocols for API integration, encryption, and access control, SNAP ensures that data flows within the Open Finance ecosystem are both secure and compliant with prevailing regulatory standards, strengthening the overall governance of consumer rights in Indonesia's digital financial sector.

However, despite these advancements, significant loopholes persist, leading to consumer rights abuses and threats to protection in Open Finance. A primary vulnerability is the lack of a dedicated, independent data protection authority, unlike the GDPR's supervisory bodies, resulting in fragmented enforcement.⁷² The Personal Data Protection Law's grace period until 2024 has delayed full implementation, exacerbating risks like uninformed consent due to low digital literacy, particularly in rural areas where only 45% of users comprehend data-sharing implications.⁷³ A 2024 Financial Services Authority survey revealed high urban awareness (70%) but widespread rural gaps, enabling misuse by fintech's.⁷⁴ Cases like the "*Cash Cepat*" data breach, where customer information was stored insecurely overseas despite erasure requests, highlight weak cross-jurisdictional oversight.⁷⁵

Loopholes in sanctions and enforcement continue to pose significant risks to consumer protection within Indonesia's Open Finance ecosystem. While the Personal Data Protection Law (PDP Law, Law Number 27 of 2022) establishes criminal and administrative penalties for violations, overlapping provisions with other sectoral regulations, such as the Electronic Information and Transactions Law (Law Number 11 of 2008, amended), create areas of ambiguity that hinder consistent enforcement.⁷⁶ This overlap complicates the attribution of responsibility

⁷¹ Paripurna and Wicaksono, "Enhancing the competitiveness," 160.

⁷² Algamar, and Ismail, "Data Subject Access," 486. See also, Widiatedja, and Mishra, "Establishing an independent," 263.

⁷³ Afif Noor et al., "Overcoming regulatory hurdles in the Indonesian crowdfunding landscape," *Volksgeist: Jurnal Ilmu Hukum Dan Konstitusi* (2023): 252. See also, Rahman, "Safeguarding Personal Data," 14.

⁷⁴ Nuzul Rahmayani, "Tinjauan Hukum Perlindungan Konsumen Terkait Pengawasan Perusahaan Berbasis Financial Technology di Indonesia," *Pagaruyuang Law Journal* 2, no. 1 (2018): 30.

⁷⁵ Muhammad Fakhruddin Zuhri et al., "The Analysis of Direct Grant Policy in Covid-19 Pandemic in Justice Perspective," *Unifikasi: Jurnal Ilmu Hukum* 8, no. 1 (2021): 123.

⁷⁶ Muhammad Deckri Algamar, and Abu Bakar Munir, "Managing Indonesian Data Breach Notification in the Financial Services Sector: A Case for One-Stop Notification Model," *Journal of Central Banking Law and Institutions* 3, no. 3 (2024): 554. See also, A. Rohendi, and D. B. Kharisma, "Personal data protection in fintech: A case study from Indonesia," *Journal of Infrastructure, Policy and Development* 8, no. 7 (2024): 4158; Noor et al., "Overcoming regulatory hurdles," 254; Sudarwanto, and Kharisma, "Comparative study of personal," 1447.

when data breaches occur, particularly in cases where multiple regulatory bodies have jurisdiction over digital financial services.

Several studies highlight that the heavy reliance on Financial Services Authority regulations, without complementary legal instruments that provide binding enforcement, leaves the digital finance sector exposed to potential gaps in compliance oversight.⁷⁷ For instance, Open API frameworks, which are central to enabling interoperability in Open Finance, simultaneously increase the potential vectors for data breaches. Without a designated agency responsible for monitoring and responding to such incidents, reporting processes are often inefficient and costly, which can lead to lapses in accountability and the possibility of stakeholders avoiding responsibility for mishandled consumer data.⁷⁸

The lack of a centralized authority or dedicated data protection body exacerbates enforcement difficulties, as responsibilities are fragmented across multiple institutions. This fragmentation allows for scenarios in which sensitive consumer data may be monetized or shared without adequate oversight, leaving consumers with limited avenues for recourse.⁷⁹ Studies also indicate that current regulatory frameworks for Open Finance and Embedded Finance do not fully establish clear mechanisms to ensure consumer rights are protected when financial and personal data are used across diverse digital platforms.⁸⁰

Furthermore, threats extend to emerging technologies like AI and Big Data in fintech, where data governance lacks specificity, enforceability, and adaptability.⁸¹ Cyberattacks, such as ransomware, exploit these gaps, with Indonesia facing frequent breaches in e-commerce and peer-to-peer lending.⁸² The absence of comprehensive civil claims for breaches contrasts with GDPR's mechanisms, leaving consumers vulnerable.⁸³ Moreover, the "bank-centric" model in Financial Services Authority regulations grants banks discretionary TPP access, potentially

⁷⁷ Ayup Suran Ningsih et al., "Jurisdiction in Financial Crime: A Legal Analysis of the Investigative Authority of Indonesia's Financial Services Authority in Money Laundering Cases," *Jambura Law Review* 7, no. 2 (2025): 472. See also, Ampuan Situmeang et al., "Contextualizing Consumer Data Protection within the Operational Principles of Banking: A Legal Inquiry," *Legal Spirit* 8 (2024): 365.

⁷⁸ Amalia et al., "Legal Issues of Personal Data," 341. See also, Ningsih et al., "Jurisdiction in Financial Crime," 474.

⁷⁹ Amalia et al., "Legal Issues of Personal Data," 342.

⁸⁰ Ningsih et al., "Jurisdiction in Financial Crime," 475. See also, Sudarwanto, and Kharisma, "Comparative study of personal," 1449.

⁸¹ Damaris et al., "Data Governance for Artificial," 454. See also, Junaidi et al., "Legal Reform of Artificial," 589.

⁸² Algamar, and Ismail, "Data Subject Access," 487. See also, Ozili, "Digital Innovations for Increasing," 179.

⁸³ McDermott, "Conceptualising the right," 2059.

reducing consumer choice and fostering conflicts of interest.⁸⁴ This mirrors challenges in the EU and UK, where mandatory sharing under PSD2 balances innovation but requires strong safeguards.⁸⁵ Lastly, infrastructure disparities compound abuses, as MSMEs and startups struggle with security standards, favoring large institutions and widening the digital divide.⁸⁶ Consumer complaints systems remain underdeveloped, delaying responses to violations.⁸⁷ Initiatives like Financial Services Authority digital literacy (*Otoritas Jasa Keuangan/OJK*) – the Ministry of Communication (*Kementerian Komunikasi dan Informatika/Kemenkominfo*) and Informatics programs and fintech dashboards (e.g., Bank Mandiri, DANA) aim to mitigate this, but uneven adoption persists.⁸⁸

3.4. Securing Open Finance in Indonesia as Digital Democracy

Securing Open Finance in Indonesia necessitates robust independent oversight and harmonized regulatory frameworks to ensure the protection of consumer data while simultaneously fostering innovation, competition, financial inclusion, and the broader principles of digital democracy. Open Finance extends beyond traditional Open Banking by enabling broader and more interoperable data sharing across multiple financial services, including banking, insurance, investment, and payment platforms, through the use of standardized Application Programming Interfaces (APIs).⁸⁹ In Indonesia, the regulatory foundation for managing this ecosystem is provided by Law Number 27 of 2022 on Personal Data Protection (PDP Law), which emphasizes principles of transparency, informed consent, and data sovereignty, ensuring that consumers retain control over their personal and financial information.⁹⁰ By empowering individuals to exercise control over their data and participate in decision-making regarding its use, Open Finance contributes to digital democratic governance, enhancing accountability, participation, and equitable access to financial services. Despite this legal foundation, existing loopholes persist, particularly due to fragmented enforcement across multiple institutions, overlapping sectoral regulations such as the Electronic Information and Transactions Law, and uneven technical capacity among financial service

⁸⁴ Pati and Pratama, “Indonesia’s Open Banking Future,” 38. See also, Preziuso et al., “Open banking and inclusive,” 124.

⁸⁵ Giuseppe Colangelo, “Open Banking goes to Washington: Lessons from the EU on regulatory-driven data sharing regimes,” *Computer Law & Security Review* 54, no. 5 (2024): 1060. See also, De Pascalis, “The journey to open finance,” 846.

⁸⁶ Aprita, “Peranan peer to peer,” 43. See also, Li et al., “Can digital finance,” 289.

⁸⁷ Rahmayani, “Tinjauan Hukum Perlindungan Konsumen,” 33.

⁸⁸ Grassi, “In a world of,” 735. See also, Novita, and Santoso, “The Urgency of Updating,” 47.

⁸⁹ Casolaro et al., “Open banking: a systematic,” 345. See also, Arner et al., “Building Open Finance,” 460; Remolina Leon, “Open finance: Regulatory,” 47.

⁹⁰ Hermawan et al., “Triangular insight on open,” 203. See also, Muqorobin et al., “Pengaruh Open Banking,” 79; Paripurna and Wicaksono, “Enhancing the competitiveness,” 161.

providers, which collectively increase the risk of data breaches and misuse.⁹¹ Establishing an independent Personal Data Protection Commission (PDPC) to oversee compliance and harmonizing regulations to reduce ambiguity can address these vulnerabilities, drawing inspiration from international models such as the European Union's GDPR and Singapore's collaborative regulator-industry frameworks, which combine strict enforcement with interoperability, consumer empowerment, and digital democratic participation mechanisms.⁹²

Independent oversight is essential for ensuring centralized and effective enforcement in Indonesia's Open Finance ecosystem. Currently, regulatory responsibilities are dispersed among multiple bodies, including the Financial Services Authority, Bank Indonesia, and the Ministry of Communication and Informatics (*Kementerian Komunikasi dan Informatika/Kemenkominfo*), creating inefficiencies, gaps in accountability, and inconsistent enforcement of consumer data protection standards.⁹³ The establishment of a Personal Data Protection Commission (PDPC), as envisioned in the Personal Data Protection Law, would consolidate oversight functions, including monitoring, audits, and dispute resolution, providing a single authoritative body similar to the supervisory authorities under the European Union's General Data Protection Regulation (GDPR).⁹⁴ A PDPC could investigate breaches, impose sanctions, and ensure compliance with core data protection principles such as data minimization, security, and transparency.⁹⁵ For example, in incidents like the "*Cash Cepel*" data breach, where consumer information was insecurely stored on overseas servers, a centralized commission could enforce cross-jurisdictional standards and prevent parties from evading responsibility.⁹⁶ Additionally, the PDPC would oversee the use of emerging technologies such as AI and Big Data in fintech applications, addressing privacy risks, algorithmic biases, and data governance concerns through

⁹¹ Algamar, and Munir, "Managing Indonesian," 555. See also, Noor et al., "Overcoming regulatory hurdles," 255; Sudarwanto, and Kharisma, "Comparative study of personal," 1450.

⁹² Arner et al., "Building Open Finance," 462. See also, Mitrou, "The General Data Protection," 26; Widiatedja, and Mishra, "Establishing an independent," 265.

⁹³ Algamar, and Ismail, "Data Subject Access," 488. See also, Rahman, "Safeguarding Personal Data," 13; Widiatedja, and Mishra, "Establishing an independent," 267.

⁹⁴ Simant Shankar Bharti, and Saroj Kumar Aryal, "The right to privacy and an implication of the EU General Data Protection Regulation (GDPR) in Europe: Challenges to the companies," *Journal of Contemporary European Studies* 31, no. 4 (2023): 1397. See also, Bell et al., "Balancing data subjects' rights," 49; Mitrou, "The General Data Protection," 27.

⁹⁵ Kiss, and Szóke, "Evolution or revolution?" 313. See also, McDermott, "Conceptualising the right," 2060; Sipior et al., "Ethics of collecting," 61.

⁹⁶ Amalia et al., "Legal Issues of Personal Data," 344. See also, Ningsih et al., "Jurisdiction in Financial Crime," 474; Zuhri et al., "The Analysis of Direct," 123.

guidelines on transparency, accountability, and ethical usage.⁹⁷ By being organizationally independent, the PDPC could reduce conflicts of interest and enhance public trust, as demonstrated in comparative models in Hong Kong and Malaysia.⁹⁸

Harmonized regulations are essential to eliminate overlaps and ambiguities in Indonesia's Open Finance ecosystem, where the Personal Data Protection Law (PDP Law) intersects with other legal instruments such as the Electronic Information and Transactions Law (Number 11/2008, amended) and Financial Services Authority Regulation 13/POJK.02/2022, often creating confusion regarding the sanctioning of violations.⁹⁹ By integrating these laws into a unified regulatory framework, the government could clarify institutional roles, standardize enforcement procedures, and incorporate risk-based approaches to data protection, ensuring consistent accountability across all stakeholders.¹⁰⁰ For example, mandating privacy by design in API development embeds security measures directly into system architectures, reducing potential breach vectors in Open Finance transactions.¹⁰¹ Complementing this, GDPR-inspired impact assessments for emerging technologies can proactively identify risks in AI applications, such as algorithmic bias and discrimination, while guiding responsible data management practices.¹⁰² Harmonization should also promote reciprocal data portability, enabling consumers to securely transfer their data across platforms, stimulating competition and innovation, as observed in the UK's Open Banking model.¹⁰³ For cross-border data flows, harmonized standards can balance the need for secure international transfers with minimal restrictions, drawing lessons from

⁹⁷ Damaris et al., "Data Governance for Artificial," 455. See also, Aldboush, and Ferdous, "Building trust in fintech," 91; Junaidi et al., "Legal Reform of Artificial," 591; Abi, "Machine learning for credit," 898.

⁹⁸ Rudi Natamiharja, and Ikhsan Setiawan, "Guarding privacy in the digital age: A comparative analysis of data protection strategies in Indonesia and France," *Jambe Law Journal* 7, no. 1 (2024): 242. See also, Rohendi, and Kharisma, "Personal data protection," 4159; Sudarwanto, and Kharisma, "Comparative study of personal," 1452.

⁹⁹ Sulton Fikri Hufon et al., "Digital Platform Power Play: Indonesian and European Union Law Perspective," *Lex Scientia Law Review* 8, no. 2 (2024): 723. See also, Noor et al., "Overcoming regulatory hurdles," 25; Sudarwanto, and Kharisma, "Comparative study of personal," 1453.

¹⁰⁰ Mitrou, "The General Data Protection," 29. See also, Pavlidis, "Europe in the digital age," 469; Quach et al., "Digital technologies: tensions," 1315.

¹⁰¹ Novita, and Santoso, "The Urgency of Updating," 48. See also, Stefanelli, and Manta, "Digital financial services," 19; Paripurna and Wicaksono, "Enhancing the competitiveness," 163.

¹⁰² Juniarto, "Menyoal demokrasi digital," 33. See also, Damaris et al., "Data Governance for Artificial," 458; Charitou, "Machine Learning for Money," 36.

¹⁰³ M. Goyens, "Effective consumer protection frameworks in a global and digital world," *Journal of Consumer Policy* 43, no. 1 (2020): 196. See also, Pati and Pratama, "Indonesia's Open Banking Future," 42. See also, Wiwoho et al., "Reciprocal Data Portability," 142.

EU-US regulatory interactions to safeguard consumer rights while supporting global fintech integration.¹⁰⁴

Fostering collaborations between regulators, financial institutions, and industry stakeholders complements independent oversight and harmonized regulations in Indonesia's Open Finance ecosystem. Drawing lessons from Singapore and Hong Kong, the establishment of regulator-industry partnerships and ethical data councils can provide guidance on responsible and equitable data usage.¹⁰⁵ These councils, comprising banks, fintech providers, and civil society representatives, could address ethical considerations, including algorithmic biases in machine learning applications such as credit scoring, and ensure transparency in automated decision-making processes.¹⁰⁶ Collaborative frameworks can also standardize API protocols under Bank Indonesia's National Open API Payment Standard, enhancing interoperability, security, and compliance, particularly for micro, small, and medium enterprises (MSMEs) that often lack advanced technological infrastructure.¹⁰⁷ In addition, these partnerships can strengthen digital literacy initiatives targeting rural and underserved populations, addressing gaps in informed consent and ensuring users understand the implications of data sharing across Open Finance platforms.¹⁰⁸ By combining technical standardization with educational outreach, such collaborative mechanisms can empower consumers, improve data governance, and foster trust, while supporting the secure and inclusive expansion of Indonesia's digital financial ecosystem.

Technical and operational enhancements are essential to strengthen consumer data protection within Indonesia's Open Finance ecosystem. While Financial Services Authority regulations require financial institutions to implement encryption, multi-factor authentication, and other security protocols, smaller firms, including fintech startups and MSMEs, often struggle to meet these technical standards due to limited resources and expertise.¹⁰⁹ Introducing tiered compliance frameworks could address this challenge by scaling security requirements according

¹⁰⁴ Colangelo, "Open Banking goes," 1062. See also, Rahman, and Mulyani, "Minimising unnecessary restrictions," 286; Winn, "Open Systems, Free Markets," 1178.

¹⁰⁵ Gogia, and Chakraborty, "Open banking: a revolution," 112. See also, Arner et al., "Building Open Finance," 463; Preziuso et al., "Open banking and inclusive," 125.

¹⁰⁶ Aldboush, and Ferdous, "Building trust in fintech," 93. See also, Abi, "Machine learning for credit," 897; Fasnacht, "Open innovation in the financial," 111.

¹⁰⁷ Li, and Li, "Digital inclusive finance," 1014. See also, Li et al., "Can digital finance," 290; Paripurna and Wicaksono, "Enhancing the competitiveness," 164.

¹⁰⁸ Asimakopoulos et al., "Impact of information," 51. See also, Aprita, "Peranan peer to peer," 45; Grassi, "In a world of," 737; Grassi et al., "The Digital Evolution," 348; Rahman, "Safeguarding Personal Data," 16.

¹⁰⁹ Haykal, "Toward a Responsive Legal," 239. See also, Kurniawan et al., "Criminal Sanctions and Personal," 228; Novita, and Santoso, "The Urgency of Updating," 49; Situmeang et al., "Contextualizing Consumer Data," 367.

to firm size and risk profile, ensuring robust protection without creating undue barriers for smaller market participants. Additionally, mandatory breach notification mechanisms integrated into a one-stop reporting system would streamline the disclosure of data incidents, allowing regulators to respond efficiently and reducing delays in enforcing corrective actions.¹¹⁰ Enhancing consumer autonomy through interactive consent dashboards, similar to those employed in data-driven insurance products, enables users to monitor, manage, and revoke data-sharing permissions in real time, fostering trust and accountability.¹¹¹ Furthermore, addressing the prevailing “bank-centric” model by mandating standardized access for Third-Party Providers (TPPs) reduces fragmentation in the ecosystem, mitigates conflicts of interest, and promotes fair competition, aligning with practices in international Open Finance frameworks.¹¹² Collectively, these technical and operational measures provide the foundation for a secure, scalable, and consumer-focused Open Finance environment in Indonesia.

Consumer empowerment and inclusion are fundamental outcomes of a well-regulated Open Finance ecosystem. Low levels of digital literacy, particularly in rural and marginalized communities, increase the risk of uninformed consent and potential misuse of personal financial data.¹¹³ Targeted education campaigns, including interactive digital tools, social media outreach, and community-based programs, can bridge these gaps, equipping consumers with knowledge of their data rights, consent management, and safe engagement with financial services. Harmonized rules and regulations further reinforce inclusion by safeguarding vulnerable groups from discrimination, technological exclusion, or bias in algorithm-driven services such as credit scoring, lending, and insurance.¹¹⁴ Efficient and accessible dispute resolution mechanisms, such as arbitration, ombudsman services, or online complaint platforms, allow consumers to address grievances promptly, although cost and procedural challenges remain to be mitigated.¹¹⁵ Collectively, these measures enhance consumer autonomy, trust, and equitable access, ensuring that participation in Open Finance is informed, secure, and inclusive. By combining education, harmonized protections, and effective

¹¹⁰ Algamar, and Ismail, “Data Subject Access,” 489. See also, Panjaitan et al., “Strengthening Consumer Protection,” 673.

¹¹¹ Tolegenov et al., “Digital Transparency and Consumer,” 279. See also, Grassi, “In a world of,” 738; Prastyanti, and Sharma, “Establishing Consumer Trust,” 362.

¹¹² Pati and Pratama, “Indonesia’s Open Banking Future,” 35. See also, De Pascalis, “The journey to open finance,” 848; Remolina Leon, “Open finance: Regulatory,” 49.

¹¹³ Ferretti, and Petkoff, “Open finance and consumer,” 227. See also, Ozili, “Digital Innovations for Increasing,” 180; Rahmayani, “Tinjauan Hukum Perlindungan Konsumen,” 35.

¹¹⁴ Xie, and Hu, “Open banking: An early,” 77.

¹¹⁵ Floris De Witte, *Justice in the EU: The emergence of transnational solidarity*, (Great Clarendon Street: Oxford University Press, 2015), 23. See also, Cherednychenko, “EU Financial regulation,” 857; Amzulian, “The Future of Arbitration,” 71.

remedies, Indonesia can foster a digital financial ecosystem that not only supports innovation and growth but also upholds the rights and empowerment of all consumers.

4. Conclusion

Indonesia faces two paths in developing Open Finance: becoming a tool for economic democratization or risking deepening digital inequality. On the one hand, this technology opens financial access to millions of previously marginalized communities, enabling marginalized groups to use digital transaction data as a substitute for physical collateral to access loans. However, without democratically oriented regulations, citizens' financial data is vulnerable to exploitation for mass surveillance, algorithmic discrimination, or unilateral political interests. Learning from the best practices of the UK and Australia, Indonesia needs to build a system that prioritizes transparency, public participation, and data sovereignty. Inspiration from the UK, such as the CMA Order overseen by the Financial Conduct Authority (FCA), demonstrates the importance of algorithmic transparency. Indonesia could require fintech companies to publicly explain credit assessment criteria for example, whether loan rejections are based on spending patterns or geographic location to prevent hidden bias.

Meanwhile, Australia, through its Consumer Data Right, teaches the value of granular control over data: consumers have the right to choose the type of data shared and to revoke access at any time. This principle needs to be adapted to local contexts, such as using simple language for data consent or involving community leaders as digital education mediators in remote areas. Public participation is key to digital democracy. The European Union has demonstrated that involving civil society, academics, and vulnerable groups in policy formulation such as the two-year public consultation for PSD2 results in inclusive regulations. Indonesia should emulate this approach by holding multistakeholder forums that ensure the voices of the public are heard, not just corporate interests. Furthermore, law enforcement must be firm: implementing progressive fines in the EU's GDPR style for data breaches and establish an independent audit body composed of technology experts, human rights experts, and consumer representatives to oversee Open Finance practices.

Digital literacy is a vital tool. Culture-based education, such as training through folklore or workshops in local communities, can transform citizens from passive objects into sovereign subjects. By combining global democratic principles with the values of Pancasila, Indonesia can create an Open Finance ecosystem that is not only innovative but also upholds justice. Ultimately, digital democracy is not just about transferring data, but also ensuring that every citizen from small traders

in traditional markets to fishermen in remote areas has control over their data and a voice in policies that shape the future of the digital economy. This is the essence of true democracy: technology that empowers, not dominates.

References

- Abi, Roland. "Machine learning for credit scoring and loan default prediction using behavioral and transactional financial data." *World Journal of Advanced Research and Review* 26, no. 3 (2025): 884-904.
- Aldboush, Hassan HH, and Marah Ferdous. "Building trust in fintech: an analysis of ethical and privacy considerations in the intersection of big data, AI, and customer trust." *International Journal of Financial Studies* 11, no. 3 (2023): 90.
- Algamar, Muhammad Deckri, and Abu Bakar Munir. "Managing Indonesian Data Breach Notification in the Financial Services Sector: A case for one-stop notification model." *Journal of Central Banking Law and Institutions* 3, no. 3 (2024): 547-584.
- Algamar, Muhammad Deckri, and Noriswadi Ismail. "Data Subject Access Request: What Indonesia Can Learn and Operationalise In 2024?." *Journal of Central Banking Law and Institutions* 2, no. 3 (2023): 481-512.
- Amalia, Camila, Esha Gianne Poetry, Mochamad Kemal Kono, Dadang Arief Kusuma, and Alex Kurniawan. "Legal Issues of Personal Data Protection and Consumer Protection in Open Api Payments." *Journal of Central Banking Law and Institutions* 1, no. 2 (2022): 323-352.
- Amin, Fakhry, Silkania Swarizona, Trihadi Kuncahyo, Yasser Arafat, and Riesta Ayu Oktarina. "Digital Democracy Political Participation Through Technology in the Modern Era." *Int. J. Sci. Soc* 5, no. 2 (2023): 291-301.
- Amzulian, Aussielia. "The Future of Arbitration for Personal Data Disputes in Indonesia: Weighing the Benefits and Challenges." *Media Iuris* 8, no. 2 (2025): 64-88.
- Aprita, Serlika Aprita Serlika. "Peranan peer to peer lending dalam menyalurkan pendanaan pada usaha kecil dan menengah." *Jurnal Hukum Samudra Keadilan* 16, no. 1 (2021): 37-61.
- Arifin, Zainal, Zico Junius Fernando, and Emi Puasa Handayani. "Implikasi Hukum Perubahan Kedua Undang-Undang Informasi dan Transaksi Elektronik: Menyeimbangkan Kebebasan Berpendapat dan Partisipasi Publik dalam Demokrasi Digital: Legal Implications of The Second Amendment to The Electronic Information and Transactions Law: Balancing Freedom of Expression and Public Participation in Digital Democracy." *LITIGASI* 26, no. 1 (2025): 192-227.
- Arner, Douglas W., Christine Meng Lu Wang, Ross P. Buckley, and Dirk A. Zetzsche. "Building Open Finance: From Policy to Infrastructure." *CFTE Academic and Industry Paper Series, Centre for Finance, Technology and Entrepreneurship (CFTE)* 8, no. 4 (2025): 456-472.
- Asimakopoulous, George, Hera Antonopoulou, Konstantinos Giotopoulos, and Constantinos Halkiopoulos. "Impact of information and communication technologies on democratic processes and citizen participation." *Societies* 15, no. 2 (2025): 40-78.
- Aulia, Muhammad Rizki. "Strengthening Legal Mechanisms for Consumer Protection in the Digital Marketplace." *Interdisciplinary Studies in Society, Law, and Politics* 2, no. 4 (2023): 1-3.
- Awrey, Dan, and Joshua Macey. "The promise & perils of open finance." *Yale J. on Reg.* 40, no. 9 (2023): 1-34.
- Ayunda, Rahmi. "Personal Data Protection to E-Commerce Consumer: What Are the Legal Challenges and Certainties." *Law Reform* 18, no. 2 (2022): 144-163.
- Bell, Jessica, Stergios Aidinlis, Hannah Smith, Miranda Mourby, Heather Gowans, Susan E. Wallace, and Jane Kaye. "Balancing data subjects' rights and public interest research: Examining the interplay between UK law, EU human rights law and the GDPR." *Eur. Data Prot. L. Rev.* 5 (2019): 43-56.
- Berg, Sebastian, and Jeanette Hofmann. "Digital democracy." *Internet Policy Review* 10, no. 4 (2021): 1-23.

- Bharti, Simant Shankar, and Saroj Kumar Aryal. "The right to privacy and an implication of the EU General Data Protection Regulation (GDPR) in Europe: Challenges to the companies." *Journal of Contemporary European Studies* 31, no. 4 (2023): 1391-1402.
- Brodsky, Laura, and Liz Oakes. "Data sharing and open banking." *McKinsey & Company* 15, no. 2 (2017): 01-08.
- Busch, Danny. "The future of EU financial law." *Capital markets law journal* 17, no. 1 (2022): 52-94.
- Casolaro, Ana Maria Barbosa, Gabriela Nogueira Rauber, and Ursula Silveira Monteiro de Lima. "Open banking: a systematic literature review." *Journal of Banking Regulation* 26, no. 3 (2025): 340-355.
- Charitou, C. "Machine Learning for Money Laundering Risk Detection in Online Gambling." PhD diss., City, University of London, 2021.
- Cherednychenko, Olha O. "EU Financial regulation and private law: Towards a holistic approach." In *The Transformation of Private Law—Principles of Contract and Tort as European and International Law: A Liber Amicorum for Mads Andenas*, pp. 855-882. Cham: Springer International Publishing, 2024.
- Colangelo, Giuseppe. "Open Banking goes to Washington: Lessons from the EU on regulatory-driven data sharing regimes." *Computer Law & Security Review* 54, no. 5 (2024): 1060-1082.
- Damaris, Regina, Sinta Dewi Rosadi, and I. Made Diyosena Bratadana. "Data governance for artificial intelligence implementation in the financial sector: An Indonesian Perspective." *Journal of Central Banking Law and Institutions* 4, no. 3 (2025): 445-472.
- De Pascalis, Francesco. "The journey to open finance: learning from the open banking movement." *European business law review* 33, no. 3 (2022): 839-845.
- De Witte, Floris. *Justice in the EU: The emergence of transnational solidarity*. Great Clarendon Street: Oxford University Press, 2015.
- Fasnacht, Daniel. "Open innovation in the financial services." In *Open innovation ecosystems: Creating new value constellations in the financial services*, pp. 97-130. Cham: Springer International Publishing, 2018.
- Fauzy, Elfian, and Nabila Alif Radika Shandy. "Hak Atas Privasi dan Politik Hukum Undang-Undang Nomor 27 Tahun 2022 Tentang Pelindungan Data Pribadi." *Lex Renaissance* 7, no. 3 (2022): 445-461.
- Ferretti, Federico, and Peter Petkoff. "Open finance and consumer protection: uneasy bedfellows." *Law and Economics Yearly Review* 11, no. 2 (2022): 261-298.
- Fischli, Roberta. "Data-owning democracy: Citizen empowerment through data ownership." *European Journal of Political Theory* 23, no. 2 (2024): 204-223.
- Fitriyanti, Fadia, Stephanie Devty, Syahmilian Putri, and Reyhan Edgarda Thora. "Securing personal data in E-Kyc: vital for digital economy growth." *Diponegoro Law Review* 9, no. 1 (2024): 104-120.
- Goddard, Michelle. "The EU General Data Protection Regulation (GDPR): European regulation that has a global impact." *International Journal of Market Research* 59, no. 6 (2017): 703-705.
- Gogia, Jyoti, and Debasis Chakraborty. "Open banking: a revolution in the Tech-Fin industry." *International Journal of Electronic Banking* 3, no. 2 (2022): 100-120.
- Goyens, M. "Effective consumer protection frameworks in a global and digital world." *Journal of Consumer Policy* 43, no. 1 (2020): 195-207.
- Grassi, Laura, Filippo Renga, Alessandro Faes, and Claudio Garitta. "The Digital Evolution of Italian Financial Services: Client Behavior and Market Shifts." In *Fintech and the Emerging Ecosystems: Exploring Centralised and Decentralised Financial Technologies*, pp. 343-356. Cham: Springer Nature Switzerland, 2025.
- Grassi, Laura. "In a world of Open Finance, are customers willing to share data? An analysis of the data-driven insurance business." *Eurasian Business Review* 14, no. 3 (2024): 727-753.

- Hafis, Muhammad, Delvi Yusril, and Yulius Rico Adrianto. "Implikasi Hukum Terhadap Perlindungan Konsumen Dalam Era Digital." *Jurnal Kajian Hukum Dan Kebijakan Publik* | E-ISSN: 3031-8882 1, no. 2 (2024): 194-197.
- Haykal, Hassanain. "Toward a Responsive Legal Framework: Addressing Transaction Security Risks in Indonesia's Digital Banking Services." *International Journal of Law and Society (IJLS)* 4, no. 2 (2025): 234-249.
- Hermawan, Sapto, Zenia Aziz Khoirunisa, and Kukuh Tejomurti. "Triangular insight on open banking in Indonesia, Singapore, and Australia." *International Journal of Legal Information* 51, no. 3 (2023): 197-215.
- Hoofnagle, Chris Jay, Bart Van Der Sloot, and Frederik Zuiderveen Borgesius. "The European Union general data protection regulation: what it is and what it means." *Information & Communications Technology Law* 28, no. 1 (2019): 65-98.
- Hufron, Sul-toni Fikri, Syofyan Hadi, Ievgenii Shulga, and Agung Satryo Wibowo. "Digital Platform Power Play: Indonesian and European Union Law Perspective." *Lex Scientia Law Review* 8, no. 2 (2024): 707-742.
- Ikram, Nur Adlin Hanisah Shahul. "Data breaches exit strategy: A comparative analysis of data privacy laws." *Malaysian J. Syariah & L.* 12, no. 3 (2024): 135-156.
- Imawan, Riswanda. "Digital Democracy: The Evolution of Indonesia Electoral Politics." *The Sunan Ampel Review of Political and Social Sciences* 3, no. 1 (2023): 65-78.
- Jablonowska, Agnieszka, and Giacomo Tagiuri. "Rescuing transparency in the digital economy: in search of a common notion in EU consumer and data protection law." *Yearbook of European Law* 42 (2023): 347-387.
- Jartelius, Martin. "The 2020 data breach investigations report—a CSO's perspective." *Network Security* 2020, no. 7 (2020): 9-12.
- Junaidi, Junaidi, Pujiono Pujiono, and Rozlinda Mohamed Fadzil. "Legal Reform of Artificial Intelligence's Liability to Personal Data Perspectives of Progressive Legal Theory." *Journal of Law and Legal Reform* 5, no. 2 (2024): 587-612.
- Juniarto, Damar. "Menyoal demokrasi digital di Indonesia." *Jurnal Dialog Kebijakan Publik* 22 (2016): 28-35.
- Kiss, Attila, and Gergely László Szőke. "Evolution or revolution? Steps forward to a new generation of data protection regulation." In *Reforming European data protection law*, pp. 311-331. Dordrecht: Springer Netherlands, 2014.
- Koc-Michalska, Karolina, and Darren Lilleker. "Digital politics: Mobilization, engagement, and participation." *Political Communication* 34, no. 1 (2017): 1-5.
- Kurniawan, Kukuh Dwi, Deassy JA Hehanussa, Rahmat Setiawan, Indah Susilowati, and Desmarani Helfisar. "Criminal Sanctions and Personal Data Protection in Indonesia." *Lex Publica* 11, no. 2 (2024): 221-247.
- Li, Zhenghui, Hanzi Chen, and Bin Mo. "Can digital finance promote urban innovation? Evidence from China." *Borsa Istanbul Review* 23, no. 2 (2023): 285-296.
- McDermott, Yvonne. "Conceptualising the right to data protection in an era of Big Data." *Big Data & Society* 4, no. 1 (2017): 2053-2078.
- Mitrou, Lilian. "The General Data Protection Regulation: a law for the digital age?." In *EU internet law: Regulation and enforcement*, pp. 19-57. Cham: Springer International Publishing, 2017.
- Muqorobin, Masculine Muhammad, Ayu Anggraini, Ayu Dwi Rahmawati, Diana Yohanes, and Faricha Dzakia Ifkarina. "Pengaruh Open Banking berbasis Open API terhadap Eksistensi Perbankan." *MAKSIMUM: Media Akuntansi Universitas Muhammadiyah Semarang* 11, no. 2 (2021): 75-84.
- Namyslowska, Monika. "Behind the digital curtain: The need for digital transparency to establish digital fairness." *Journal of European Consumer and Market Law* 13, no. 6 (2024): 255-262.

- Natamiharja, Rudi, and Ikhsan Setiawan. "Guarding privacy in the digital age: A comparative analysis of data protection strategies in Indonesia and France." *Jambe Law Journal* 7, no. 1 (2024): 233-251.
- Nicholls, Christopher C. "Open banking and the rise of FinTech: innovative finance and functional regulation." *Banking & finance law review* 35, no. 1 (2019): 121-151.
- Niffari, Hanifan. "Perlindungan Data Pribadi Sebagai Bagian Dari Hak Asasi Manusia Atas Perlindungan Diri Pribadi (Suatu Tinjauan Komparatif Dengan Peraturan Perundang-Undangan Di Negara Lain)." *Jurnal Yuridis* 7, no. 1 (2020): 105-119.
- Ningsih, Ayup Suran, Paramita Prananingtyas, Adinda Maura Salwa, Ferra Tiara Maharani, and Harumsari Puspa Wardhani. "Jurisdiction in Financial Crime: A Legal Analysis of the Investigative Authority of Indonesia's Financial Services Authority in Money Laundering Cases." *Jambura Law Review* 7, no. 2 (2025): 468-492.
- Noor, Afif, Ismail Marzuki, Edy Saputro, and Muhammad Akmal Habib. "Overcoming regulatory hurdles in the Indonesian crowdfunding landscape." *Volksgeist: Jurnal Ilmu Hukum Dan Konstitusi* (2023): 245-260.
- Novita, Yustina Dhian, and Budi Santoso. "The Urgency of Updating Consumer Protection Regulations in the Digital Business Era." *Indonesian Journal of Legal Development* 3, no. 1 (2021): 46-58.
- Ozili, Peterson K. "Digital Innovations for Increasing Financial Inclusion: CBDC, Cryptocurrency, Embedded finance, Artificial Intelligence, WaaS, Fintech, Bigtech, and DeFi." In *Impact of Artificial Intelligence on Society*, pp. 174-184. Chapman and Hall/CRC, 2024.
- Ozili, Peterson K. "Embedded finance: assessing the benefits, use case, challenges and interest over time." *Journal of Internet and Digital Economics* 2, no. 2 (2022): 108-123.
- Panjaitan, Hulman, Junimart Girsang, Moermahadi Soerja Djanegara, and Md Hasnath Kabir Fahim. "Strengthening Consumer Protection in Digital Transactions: A Legal Perspective on Click-Wrap Agreements Under the Consumer Protection Law." *Jurnal Hukum UNISSULA* 41, no. 3 (2025): 666-693.
- Papacharissi, Zizi, and Paige L. Gibson. "Fifteen minutes of privacy: Privacy, sociality, and publicity on social network sites." In *Privacy online: Perspectives on privacy and self-disclosure in the social web*, pp. 75-89. Berlin, Heidelberg: Springer Berlin Heidelberg, 2011.
- Pavlidis, Georgios. "Europe in the digital age: regulating digital finance without suffocating innovation." *Law, Innovation and Technology* 13, no. 2 (2021): 464-477.
- Pereira, Clara Martins. "The uncertain path towards open finance: Mutual lessons from the United Kingdom and European Union regulatory approaches." In *A research agenda for financial law and regulation*, pp. 83-112. Edward Elgar Publishing, 2025.
- Poullet, Yves. "Data protection legislation: What is at stake for our society and democracy?." *Computer Law & Security Review* 25, no. 3 (2009): 211-226.
- Prastyanti, Rina Arum, and Ridhima Sharma. "Establishing Consumer Trust Through Data Protection Law as a Competitive Advantage in Indonesia and India." *Journal of Human Rights, Culture and Legal System* 4, no. 2 (2024): 354-390.
- Prezioso, Massimo, Franziska Koefer, and Michel Ehrenhard. "Open banking and inclusive finance in the European Union: perspectives from the Dutch stakeholder ecosystem." *Financial Innovation* 9, no. 1 (2023): 111-134.
- Quach, Sara, Park Thaichon, Kelly D. Martin, Scott Weaven, and Robert W. Palmatier. "Digital technologies: tensions in privacy and data." *Journal of the academy of marketing science* 50, no. 6 (2022): 1299-1323.
- Rahman, Faiz, and Cora Kristin Mulyani. "Minimising unnecessary restrictions on cross-border data flows? Indonesia's position and challenges post personal data protection act enactment." *International Review of Law, Computers & Technology* 39, no. 2 (2025): 281-300.

- Rahman, Faiz. "Safeguarding personal data in the public sector: unveiling the impact of the new personal data protection act in Indonesia." *UUM Journal of Legal Studies* 16, no. 1 (2025): 1-18.
- Rahmayani, Nuzul. "Tinjauan Hukum Perlindungan Konsumen Terkait Pengawasan Perusahaan Berbasis Financial Technology di Indonesia." *Pagaruyung Law Journal* 2, no. 1 (2018): 24-41.
- Remolina Leon, Nydia. "Open finance: Regulatory challenges of the evolution of data sharing arrangements in the financial sector." *Banking and Finance Law Review* 40, no. 1 (2023): 35-57.
- Rifa, Fauzi, and Maslihati Nur Hidayati. "Kebijakan Penal dalam Perlindungan Data Pribadi Nasabah Fintech Lending di Indonesia." *Binamulia Hukum* 13, no. 2 (2024): 461-481.
- Rohendi, A., and D. B. Kharisma. "Personal data protection in fintech: A case study from Indonesia." *Journal of Infrastructure, Policy and Development* 8, no. 7 (2024): 4158-4170.
- Rotenberg, Marc, and David Jacobs. "Updating the law of information privacy: the new framework of the European Union." *Harv. JL & Pub. Pol'y* 36 (2013): 605-623.
- Rott, Peter. "Data protection law as consumer law—How consumer organisations can contribute to the enforcement of data protection law." *Journal of European Consumer and Market Law* 6, no. 3 (2017): 543-556.
- Rubinstein, Ira S., and Nathaniel Good. "Privacy by design: A counterfactual analysis of Google and Facebook privacy incidents." *Berkeley Tech. LJ* 28, no. 3 (2013): 1333-1364.
- Salsabila, Shafa, and Sidi Ahyar Wiraguna. "Pertanggungjawaban hukum atas pelanggaran data pribadi dalam perspektif Undang-Undang Pelindungan Data Pribadi Indonesia." *Konsensus: Jurnal Ilmu Pertahanan, Hukum dan Ilmu Komunikasi* 2, no. 2 (2025): 145-157.
- Setyasih, Endang Try. "Democracy in the Digital Era as a Challenge and Opportunity for Public Participation." *Publica: Jurnal Pemikiran Administrasi Negara* 15, no. 1 (2023): 28-39.
- Sipior, Janice C., Burke T. Ward, and Nicholas M. Rongione. "Ethics of collecting and using consumer internet data." *Information Systems Management* 21, no. 1 (2004): 58-66.
- Situmeang, Ampuan, Hari Sutra Disemadi, and Irvan Ricardo Marsudi. "Contextualizing Consumer Data Protection within the Operational Principles of Banking: A Legal Inquiry." *Legal Spirit* 8 (2024): 365-78.
- Stefanelli, Valeria, and Francesco Manta. "Digital financial services and open banking innovation: are banks becoming 'invisible'?" *Global Business Review* 4, no. 2 (2023): 12-38.
- Sudarwanto, Al Sentot, and Dona Budi Budi Kharisma. "Comparative study of personal data protection regulations in Indonesia, Hong Kong and Malaysia." *Journal of Financial Crime* 29, no. 4 (2022): 1443-1457.
- Sugarda, Paripurna P., and Muhammad Rifky Wicaksono. "Enhancing the competitiveness of Indonesia's financial services sector in the digital era through open banking: Lessons learned from the UK's Experience." *Journal of Central Banking Law and Institutions* 2, no. 1 (2023): 153-178.
- Tene, Omer. "Privacy: The new generations." *International data privacy law* 1, no. 1 (2011): 15-27.
- Tolegenov, Bakyt, Kevin Rafif, Muhammad Rafi, Rafidah Herawati, Asaduddin Abdullah, and Linda Karlina Sari. "Digital Transparency and Consumer Awareness: Digital Platforms for Educating Consumers about Product Origins and Sustainability." *AL-MUZARA'AH* 12, no. 2 (2024): 277-287.
- Unver, H. Akin. "Digital challenges to democracy: Politics of automation, attention, and engagement." *Journal of International Affairs* 71, no. 1 (2017): 127-146.
- Utami, Tanti Kirana, Kayla Andini Putri, Salsa Octaviani Suryanto, and Fina Asriani. "Personal Data Breach Cases In Indonesia: Perspective Of Personal Data Protection Law." *Journal Customary Law* 2, no. 2 (2025): 21-41.
- Verizon (2024). Data Breach Investigations Report (2024). Retrieved in July 23, 2025 from <https://www.verizon.com/business/resources/reports/2024-dbir-data-breach-investigations-report.pdf>

- Warso, Zuzanna. "There's more to it than data protection—Fundamental rights, privacy and the personal/household exemption in the digital age." *Computer Law & Security Review* 29, no. 5 (2013): 491-500.
- Widiatedja, I. Gusti Ngurah Parikesit, and Neha Mishra. "Establishing an independent data protection authority in Indonesia: a future-forward perspective." *International Review of Law, Computers & Technology* 37, no. 3 (2023): 252-273.
- Winn, Jane Kaufman. "Open Systems, Free Markets, and Regulation of Internet Commerce." *Tul. L. Rev.* 72 (1997): 1177.
- Wiwoho, Jamal, Umi Khaerah Pati, and Anugrah Muhtarom Pratama. "Reciprocal Data Portability to Foster Financial Services Competition in the Open Banking System Era." *Yustisia* 13, no. 2 (2024): 134-150.
- Xie, Chengbo, and Sijia Hu. "Open banking: An early review." *Journal of Internet and Digital Economics* 4, no. 2 (2024): 73-82.
- Attidhira, Safira Widya, and Yana Sukma Permana. "Review of Personal Data Protection Legal Regulations in Indonesia." *Awang Long Law Review* 5, no. 1 (2022): 280-294.
- Zeller, Bruno, and Andrew M. Dahdal. "Open banking and open data in Australia: global context, innovation and consumer protection." *Qatar University College of Law, Working Paper Series, Working Paper* 1, no. 3 (2021): 232-257.
- Zuhri, Muhammad Fakhruddin, Fenny Bintarawati, Naili Ni'matul Illiyyun, and Daud Rismana. "The Analysis of Direct Grant Policy in Covid-19 Pandemic in Justice Perspective." *Unifikasi: Jurnal Ilmu Hukum* 8, no. 1 (2021): 113-125.