THE FUTURE OF LEGAL POLICY IN INDONESIA: ADDRESSING LABOUR MARKET SHOCKS IN THE AGE OF ARTIFICIAL INTELLIGENCE

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Abstract *– The rise of Artificial Intelligence (AI) is fundamentally reshaping labour markets globally, creating a complex dual challenge for Indonesia. While AI promises valuable gains in productivity and innovation, it simultaneously fuels significant concerns regarding job displacement and unemployment. This article critically examines AI's impact on Indonesia's employment situation through a legal theory lens, employing doctrinal research to assess how the country's labour rights and regulatory frameworks—evaluated against principles of protection, fairness, and social justice—respond to this technological disruption. The study confirms that AI both destroys existing jobs and catalyses new forms of employment, mandating a legal framework that skilfully balances innovation with essential worker protection. However, current regulations exhibit clear gaps in establishing employer responsibility, defining retraining obligations, and securing adequate social security for displaced workers. Consequently, the research argues compellingly for a progressive legal reform that incorporates responsible innovation, anticipatory regulation, and inclusive labour protection, supported by adaptive standards and robust reskilling programs, to ensure AI development genuinely aligns with sustainable employment and social welfare across Indonesia.*

Keywords*: Unemployment; Social Security Protection; Artificial Intelligence; Labour Market; Indonesia*

INTRODUCTION

The emergence of Artificial Intelligence (AI) technologies marks a new era of economic and social transformation, reshaping industries and redefining the nature of work. Across the globe, AI-driven automation, machine learning, and digital platforms are disrupting traditional employment structures, generating both optimism and apprehension. On one hand, AI promises increased productivity, efficiency, and innovation; on the other, it poses risks of labour displacement, income inequality, and social instability. These global trends are particularly salient in developing countries such as Indonesia, where structural vulnerabilities in the labour market heighten the challenges of technological disruption.[1]

Indonesia, with its vast workforce and significant reliance on low- and medium-skilled labour, faces a critical juncture in addressing the impact of AI on employment. Sectors such as manufacturing, services, and logistics are especially susceptible to automation, raising concerns about potential unemployment surges. While AI may also generate new employment opportunities in digital industries, data services, and creative sectors, the transition requires a supportive legal and institutional framework to ensure inclusivity and fairness. Without adequate safeguards, the benefits

[1] Agusmidah Agusmidah and Vatar Reynaldo, "Participation in Job Loss Security Program as Unemployment Benefit for Non Wage Recipient Participant," *Mendapo: Journal of Administrative Law* 5, no. 2 (March 12, 2024): 106–31, doi:10.22437/mendapo.v5i2.27903.

of technological progress may be unevenly distributed, deepening existing social and economic inequalities.[2]

The decline in Indonesia's unemployment rate from 7.07% in 2020 to an estimated 4.76% in 2025 reflects multiple economic and technological dynamics, among which AI plays a growing role. AI technologies have the potential to both displace and create jobs, generating a complex impact on the labour market. In sectors such as manufacturing, logistics, and certain service industries, automation powered by AI can replace repetitive or routine tasks, leading to temporary job losses for workers whose skills are no longer aligned with emerging demands. This phenomenon, often termed technological unemployment, may initially contribute to structural unemployment if the workforce is not adequately reskilled.[3]

Conversely, AI also stimulates the creation of new jobs, particularly in fields related to data science, machine learning, AI maintenance, and software development. These roles tend to be more skill-intensive and may offer higher wages, thereby attracting talent and fostering a shift towards a knowledge-based economy.[4] Over time, as workers acquire the necessary skills through education and training programmes, the net effect of AI adoption can become positive, contributing to a reduction in unemployment.

Beyond direct employment effects, AI can enhance overall productivity and economic growth. By automating routine tasks, companies can increase efficiency, reduce costs, and expand output. Such productivity gains can indirectly stimulate employment in other sectors, as growing businesses demand more labour for complementary roles that cannot be automated. Government policies also play a crucial role in shaping these outcomes; proactive measures such as reskilling programmes, labour protections, and incentives for technology adoption can mitigate the short-term adverse effects of AI while maximising its benefits. While AI introduces both challenges and opportunities for Indonesia's labour market, its influence on unemployment figures is intertwined with broader economic recovery trends, policy interventions, and workforce adaptation. The observed decline in unemployment from 2020 to 2025 reflects a combination of these factors, suggesting that AI's impact, though significant, operates within a complex socio-economic context rather than as an isolated determinant.[5]

Legal frameworks play a central role in managing this transition. In principle, Indonesian labour law is built on values of protection, fairness, and social justice, aiming to safeguard workers' rights in the face of economic change. However, the existing framework remains largely designed for traditional employment relations and has not evolved in tandem with the complexities introduced by AI-driven transformations. Issues such as the redefinition of employer responsibilities, the obligation to provide retraining and reskilling, and the provision of social security for displaced workers remain underdeveloped. This regulatory gap risks leaving large segments of the workforce unprotected in an era of rapid technological change.[6]

This paper argues that Indonesia requires a forward-looking, progressive legal approach to navigate the challenges of AI-driven labour market disruption. By employing a legal theory perspective, the

[2] Ippei Tsuruga, Simon Brimblecombe, and Alexander Landry, *Unemployment Insurance in Indonesia Challenges and Recommendations Regional Actuarial Services Unit, Decent Work Technical Support Team for East and South-East Asia and the Pacific: Bangkok International Labour Organization*, 2023, www.ilo.org/publns.

[3] Beny Saputra and Olivér Bene, "Protection Standardization Towards Unemployment in Indonesia," *Jambe Law Journal* 5, no. 1 (May 31, 2022): 123–46, doi:10.22437/jlj.5.1.123-146.

[4] Abdoulaye Ndiaye et al., "How to Fund Unemployment Insurance with Informality and False Claims: Evidence from Senegal ☆," *Journal of Monetary Economics* 150 (2024), doi:10.5281/zenodo.1.

[5] Masayuki Morikawa, Use of Artificial Intelligence and Productivity: Evidence from Firm and Worker Surveys, October 2024, https://www.rieti.go.jp/jp/publications/dp/24e074.pdf.

[6] Aída Ponce Del Castillo, Labour in the Age of AI: Why Regulation Is Needed to Protect Workers, February 2020, https://www.etui.org/publications/foresight-briefs/labour-in-the-age-of-ai-why-regulation-is-needed-to-protect-workers.

study examines how core legal principles can be reinterpreted and applied to balance technological innovation with the protection of labour rights. It highlights the importance of integrating responsible innovation, anticipatory regulation, and inclusive labour protection into Indonesia's legal framework. Central to this vision are reskilling programs, adaptive labour standards, and robust social safety nets that collectively ensure a just transition for workers.[7]

Through a doctrinal legal research approach, this article critically evaluates Indonesian labour law and policy in the context of AI-induced economic change. It seeks to contribute to the growing discourse on AI governance and labour regulation by proposing legal reforms that align technological progress with sustainable employment and social welfare. In doing so, the paper underscores that preparing for AI-driven labour shocks is not merely an economic challenge but also a fundamental question of justice, fairness, and human dignity in the future of work.

1. Indonesia's Labour Market Shocks

In Indonesia, the rise of artificial intelligence (AI) presents a double-edged sword for the labour market. On the one hand, it offers opportunities to enhance productivity, increase efficiency, and stimulate innovation across industries. On the other hand, it threatens job security for millions of workers, particularly in sectors dominated by routine tasks. The risk of displacement is heightened by Indonesia's structural reliance on low- and medium-skilled labour, which renders a significant portion of the workforce especially vulnerable to automation and digital transformation.[8]

Technological unemployment has therefore become an increasingly salient issue in Indonesia as the rapid adoption of digitalisation, automation, and AI reshapes the labour market. While these advancements have created new economic opportunities, particularly in the platform economy and digital services, they have also contributed to the displacement of traditional occupations. Routine-based jobs in manufacturing, clerical work, and retail are especially at risk, as machines and algorithms can perform such tasks with greater efficiency and lower costs. At the same time, AI technologies capable of handling cognitive functions raise concerns about disruption extending beyond low-skilled sectors into professional and service-based employment.[9]

The manufacturing sector, a cornerstone of Indonesia's economic growth, faces some of the greatest risks. AI-driven robotics and smart manufacturing systems are increasingly capable of replacing assembly-line workers, quality control staff, and warehouse operators. In the service sector, jobs in retail, hospitality, and customer service are similarly threatened, with chatbots, digital kiosks, and automated reservation systems reducing demand for human workers. Transportation and logistics, another major source of employment, may also undergo structural shifts as firms adopt AI-powered route optimisation, drone delivery, and eventually autonomous vehicles. These changes signal that technological disruption will not be confined to niche sectors but will cut across core areas of the Indonesian economy.[10]

[7] Roberta Caragnano, "Artificial Intelligence and the Labour Market: Impacts and Issues," *Athens Journal of Law* 10, no. 4 (October 1, 2024): 465–76, doi:10.30958/ajl.10-4-2.

[8] Tinu Iype Jacob and Sunil Paul, "Labour Income Share, Market Power and Automation: Evidence from An Emerging Economy," *Structural Change and Economic Dynamics* 69 (June 1, 2024): 37–45, doi:10.1016/j.strueco.2023.11.016.

[9] Bernhard Schmidpeter and Rudolf Winter-Ebmer, "Automation, Unemployment, and the Role of Labor Market Training," *European Economic Review* 137 (August 1, 2021), doi:10.1016/j.euroecorev.2021.103808.

[10] Alex De Ruyter and Riani Rachmawati, "Understanding the Working Conditions of Gig Workers and Decent Work: Evidence from Indonesia's Online Ojek Riders," *Sozialpolitik.Ch*, no. 2/2020 (December 15, 2020), doi:10.18753/2297-8224-159.

Source: Kompas 2025[11]

The data highlights the structural function of the informal sector as a shock absorber for the wider economy. The notable spike from a low of 58% in 2020 to near 60% in 2021—a period coinciding with the COVID-19 economic contraction—demonstrates that job displacement from the formal sector is immediately buffered by a mass transfer of workers into precarious, low-wage, informal roles. This pattern serves as a predictive model for AI's effect. Should automation displace a significant number of routine tasks in manufacturing or clerical work (formal sectors), the result will likely be a severe crowding effect within the informal economy. This would drive down overall informal wages, increase economic precarity, and exacerbate income inequality, directly contravening the goal of sustainable employment outlined in the research.[12] Furthermore, the new forms of employment generated by AI, such as gig work, often fall within the 'self-employed' category, structurally contributing to the high informal percentage rather than formalizing the workforce.

The challenge is compounded by Indonesia's vast informal workforce, which in recent years has encompassed more than 70 million workers. Informal workers typically lack legal protection, unemployment benefits, and access to retraining programmes, rendering them disproportionately vulnerable to displacement. Even within the formal sector, existing labour regulations do not impose clear obligations on employers to provide retraining or transition assistance for employees made redundant by automation. This highlights a critical gap in Indonesia's labour law, which remains primarily designed around conventional employer–employee relationships and is ill-equipped to address the realities of a rapidly transforming labour market.[13]

AI isn't simply a threat; it's a powerful engine for new opportunities across Indonesia's rapidly expanding digital economy—from fintech and e-commerce to data-driven services. This growth demands talent in programming, digital marketing, and data analytics. However, the path from old, vulnerable jobs to these new roles is not automatic. It requires serious, sustained investment in education, vocational training, and reskilling programs. Without these deliberate measures, the economic benefits of AI will inevitably concentrate among the urban, highly educated elite, while low-skilled and rural workers absorb the bulk of the displacement, thus significantly widening the existing socio-economic fault lines.[14]

Indonesia's current social protection system is simply not ready to handle the scale of technological unemployment shock. While the National Social Security System (SJSN) and the new unemployment insurance scheme are steps in the right direction, their effectiveness is limited by uneven coverage, especially for non-standard workers. Insufficient funding, weak enforcement, and the exclusion of the vast informal workforce severely constrain the system's ability to act as a meaningful safety net.

[11] Caecilia Mediana, "Pekerja Informal Makin Dominan", *Kompas*, May 7, 2025, https://www.kompas.id/artikel/porsi-pekerja-informal-cenderung-mendominasi, accessed in July 24, 2025

[12] Ibid.

[13] Ferry Silitonga and M Falikul Isbah, "Artificial Intelligence and the Future of Work in the Indonesian Public Sector," *Jurnal Ilmu Sosial Dan Humaniora* 12, no. 2 (August 31, 2023): 296–308, doi:10.23887/jish.v12i2.62297.

[14] Meng Qin et al., "Artificial Intelligence: Intensifying or Mitigating Unemployment?," *Technology in Society* 79 (December 1, 2024), doi:10.1016/j.techsoc.2024.102755.

If left unstrengthened, the syst[15]em will quickly buckle under the weight of automation- and AI-displaced citizens.[16]

From a deeper normative standpoint, technological job loss must be viewed as a violation of the right to work, a guarantee enshrined in both Indonesia's Constitution and international law.[17] Internationally, instruments like the Universal Declaration of Human Rights (UDHR, Article 23(1)) and the International Covenant on Economic, Social and Cultural Rights (ICESCR, Article 6) affirm this right, obligating Indonesia (as a signatory since 2006) to safeguard dignified access to employment. Domestically, the 1945 Constitution, in Article 27(2), affirms every citizen's right to work and a decent livelihood (pekerjaan dan penghidupan yang layak bagi kemanusiaan). This powerful constitutional guarantee imposes a non-negotiable duty on the state to ensure that technological change, however necessary, does not strip its citizens of their basic rights to employment security and social welfare.

Ultimately, AI-driven job displacement in Indonesia is far more than just an economic trend; it is a profound legal and social justice challenge demanding robust state intervention. Labour law must be quickly modernized to formally recognize non-standard and gig economy workers, ensuring they have access to foundational protections like social security, insurance, and retraining. Simultaneously, employers must accept greater responsibility for workforce adaptation through mandatory transition assistance and upskilling programs. By drawing on established international labour standards, such as those from the ILO, Indonesia has a critical opportunity to forge a future-proof labour regime that successfully marries innovation with fairness. Failing to enact these crucial reforms risks deepening inequality and undermining the nation's fundamental constitutional and international commitments to inclusive and sustainable development.

2. Critical Review of Indonesian Labour Law in the AI Era

The rapid advancement of technology and digitalization has profoundly transformed the employment landscape in Indonesia. These developments offer significant opportunities, including the rise of platform-based work, increased flexibility in employment arrangements, and improved efficiency in workforce management. However, they also introduce complex challenges, particularly in the areas of labour law and industrial relations.[18]

One pressing concern is the regulation of workers in the gig economy, such as ride-hailing drivers and freelancers operating through digital platforms. Their legal status remains ambiguous, positioned between independent contractors and permanent employees. This uncertainty has direct implications for labour rights, including access to social security, insurance, and other forms of workplace protection.[19] The integration of artificial intelligence (AI) into human resource management further complicates this landscape. While AI offers clear benefits in recruitment, data management, and productivity analysis, it also poses risks such as algorithmic bias influencing employment decisions and concerns regarding the protection of personal data.[20]

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[15] Rapha Efrani Tarigan et al., "Effectiveness of the Job Loss Guarantee Program (JKP) in Responding to the Phenomenon of Mass Layoffs in Indonesia in 2025," *International Journal of Sustainable Business Management and Accounting* 1, no. 1 (2025): 10–17.

[16] Tsuruga, Brimblecombe, and Landry, *Unemployment Insurance in Indonesia Challenges and Recommendations Regional Actuarial Services Unit, Decent Work Technical Support Team for East and South-East Asia and the Pacific: Bangkok International Labour Organization*.

[17] József Hajdú, "Gradual Transformation of the Right to Work in Digital Environment," *Forum: Acta Juridica et Politica* 13, no. 1 (2023): 79–95.

[18] Adrienn Hadady-Lukács, "The Future of Work – Artificial Intelligence and Labour Law," *Danube* 15, no. 3 (September 1, 2024): 188–202, doi:10.2478/danb-2024-0011.

[19] Alex J. Wood et al., "Good Gig, Bad Gig: Autonomy and Algorithmic Control in the Global Gig Economy," *Work, Employment and Society* 33, no. 1 (February 1, 2019): 56–75, doi:10.1177/0950017018785616.

[20] Valerio De Stefano, "The Rise of the 'Just-in-Time Workforce': On-Demand Work, Crowdwork and Labour Protection in the Gig-Economy," *Comparative Labor Law & Policy Journal* 37, no. 3 (2015): 471–504, www.ilo.org/publns.

Addressing these challenges requires active engagement from labour law professionals and policymakers with the evolving regulatory framework. International standards, particularly those established by the International Labour Organization (ILO) No. 168, provide valuable guidance for adapting national labour laws to contemporary realities. A comprehensive understanding of these dynamics is essential for fostering a fair and sustainable employment ecosystem. In this context, labour law should be viewed not merely as a regulatory instrument but as a catalyst for innovation and inclusivity in the modern workplace.

Historically, Indonesia's labour law framework has been designed to regulate conventional employment relationships, emphasizing worker protection, fairness, and social justice. Core provisions are contained in Law No. 13 of 2003 on Manpower, subsequently amended by the Omnibus Law on Job Creation (Law No. 11 of 2020), alongside implementing regulations and social security legislation such as Law No. 40 of 2004 on the National Social Security System and Government Regulation No. 37 of 2021 on Unemployment Insurance (Jaminan Kehilangan Pekerjaan) and ILO Convention No. 102 on Social Security Minimum Standards. While these laws establish a foundation for employment rights and social protection, they exhibit significant limitations in addressing challenges posed by AI and automation.

A critical issue lies in the definition of employment relationships, which remains anchored in the traditional employer–employee model. Rights and obligations are tied to formal contracts, leaving informal and platform-based workers—those most vulnerable to technological disruption—largely outside the scope of protection. The absence of legal recognition for gig economy and AI-mediated employment exacerbates precarity for a substantial segment of the workforce.[21]

Another challenge concerns employer obligations in cases of technological redundancy. Current regulations mandate severance pays and compensation upon termination but do not require retraining or reskilling for workers displaced by automation. This gap underscores the lack of alignment with global initiatives advocating a "just transition" for employees affected by technological change.[22]

Social security coverage also remains inadequate. Although the unemployment insurance scheme introduced in 2021 marks progress, it applies only to formal sector employees, excluding millions of informal workers. Benefits are modest and short-term, offering limited protection against structural unemployment resulting from widespread automation.[23]

Moreover, the Omnibus Law on Job Creation, intended to modernize labour regulations, has faced criticism for weakening worker protections. By simplifying hiring and termination procedures, the law risks heightening insecurity for employees in sectors most susceptible to AI adoption, rather than enhancing resilience.[24] Equally concerning is the absence of anticipatory regulation governing AI in the workplace. Current laws do not address liability for algorithmic management, transparency in AI-driven decision-making (such as recruitment or performance evaluation), or ethical standards for handling employee data. This regulatory gap leaves workers vulnerable to novel forms of rights violations in an AI-driven labour environment.[25]

Taken together, these shortcomings reveal that Indonesian labour law has yet to adapt to the complexities of the digital era. The existing framework remains focused on traditional industrial relations, failing to anticipate structural transformations driven by digitalization and automation. A forward-looking reform agenda is imperative—one that incorporates principles of responsible innovation, extends protection to informal and gig workers, and embeds obligations for retraining and reskilling as part of a comprehensive strategy to safeguard workers in the age of AI.

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[21] Laura Katsnelson, Felix Oberholzer-Gee, and Harvard Business School, *Being the Boss: Gig Workers' Value of Flexible Work*, 2021, https://www.hbs.edu/faculty/Pages/item.aspx?num=60255.

[22] Taelim Choi and Nancey Green Leigh, "Artificial Intelligence's Creation and Displacement of Labor Demand," *Technological Forecasting and Social Change* 209 (December 1, 2024), doi:10.1016/j.techfore.2024.123824.

[23] József Hajdú, *Social Protection of the Unemployed* (Szeged: University of Szeged Press, 2013).

[24] Sudharto P. Hadi, Rizkiana S. Hamdani, and Ali Roziqin, "A Sustainability Review on the Indonesian Job Creation Law," *Heliyon* 9, no. 2 (February 1, 2023), doi:10.1016/j.heliyon.2023.e13431.

[25] Rowena Rodrigues, "Legal and Human Rights Issues of AI: Gaps, Challenges and Vulnerabilities," *Journal of Responsible Technology* 4 (December 2020): 100005, doi:10.1016/j.jrt.2020.100005.

3. AI, Social Security, and Structural Risk in Indonesia

The integration of Artificial Intelligence (AI) into Indonesia's labour market introduces profound structural challenges for the country's social security system. Automation and algorithmic management are not merely cyclical disruptions; they represent a fundamental reconfiguration of work processes and occupational structures.[26] This shift intensifies the need for adaptive social protection mechanisms capable of addressing long-term displacement rather than short-term unemployment. Indonesia's social security framework, primarily governed by Law No. 40 of 2004 on the National Social Security System (SJSN) and administered by BPJS Ketenagakerjaan, currently provides benefits for occupational accidents, old-age pensions, death benefits, and unemployment insurance. While these provisions form a critical foundation, they remain insufficiently aligned with the scale and nature of AI-driven transformation.

The unemployment insurance program (Jaminan Kehilangan Pekerjaan, JKP), introduced under Government Regulation No. 37 of 2021, represents a significant policy innovation by offering cash benefits, labour market information, and vocational training to terminated workers. However, its coverage is restricted to formal sector employees, leaving Indonesia's vast informal workforce—estimated at over 70 million individuals—outside its scope. This exclusion is particularly problematic because informal jobs in retail, services, and transportation are among the most vulnerable to automation. Without mechanisms for portability and inclusion, displaced workers risk falling into deeper precarity, cycling through short-term gigs without access to social protection or structured pathways for reemployment.[27]

Even for those covered by JKP, the adequacy and duration of benefits remain modest relative to the structural nature of technological displacement. AI-driven automation is likely to generate persistent unemployment in certain sectors, making temporary cash assistance insufficient to restore labour market stability. Reintegration will require sustained investment in reskilling and vocational training programs that are responsive to emerging skill demands. Current initiatives under JKP, while commendable, are limited in scale and lack strong alignment with industry needs. A more effective approach would involve real-time labour market analytics, modular training linked to recognized credentials, and performance-based contracts for training providers to ensure measurable outcomes in employment and wage recovery.

Another critical gap lies in the absence of regulatory obligations on employers and digital platforms to contribute to reskilling and transition support. In many jurisdictions, the principle of a "just transition" has been embedded into law and policy to balance technological progress with worker protection. Indonesia's framework, however, places the burden of retraining almost entirely on the state, creating fiscal strain and limiting systemic resilience. Embedding employer responsibility—through levies, co-financing arrangements, or mandatory transition plans for automation-driven restructuring—would distribute risk more equitably and incentivize firms to invest in human capital development.[28]

Financing these reforms presents its own challenges. Expanding coverage to informal and gig workers requires innovative funding models that combine contributory mechanisms with tax-financed safeguards. Micro-contribution schemes for platform-mediated workers, supplemented by state matching for low-income cohorts, could enhance inclusivity without imposing prohibitive compliance costs. Additionally, earmarking a portion of productivity gains or automation-related capital expenditures for reskilling funds would create a sustainable link between technological progress and

[26] Hadady-Lukács, "The Future of Work – Artificial Intelligence and Labour Law."
[27] Juliette Gilman, "The Rights to Social Security and Social Assistance in the European Social Charter: Towards a Positive Content, but What Sort of Content?," *European Journal of Social Security* 26, no. 4 (December 23, 2024): 411–33, doi:10.1177/13882627241270475.
[28] Rodrigues, "Legal and Human Rights Issues of AI: Gaps, Challenges and Vulnerabilities."

social protection. These measures must be carefully calibrated to avoid disincentives for formalization or digital innovation.[29]

Beyond financial and structural considerations, the governance of data and algorithmic decision-making in social security administration demands urgent attention. As AI tools are increasingly deployed for eligibility verification, fraud detection, and benefit allocation, transparency and accountability become paramount. Regulatory frameworks should mandate algorithmic audits, bias testing, and explain ability standards to safeguard claimants' rights and prevent discriminatory outcomes. Privacy protections must also be strengthened to ensure that personal data collected for social security purposes is not misused in employment decisions or commercial profiling.[30]

Hence, these dynamics underscore the need for a comprehensive reform agenda that moves beyond incremental adjustments. Indonesia's social security system must evolve into an adaptive architecture capable of managing structural labour market transitions. This requires extending protection to informal and gig workers, embedding employer obligations for retraining, upgrading benefit design to include wage insurance and partial unemployment schemes, and institutionalizing algorithmic governance. By aligning social security policies with the realities of technological disruption, Indonesia can mitigate inequality, preserve social cohesion, and foster an inclusive transition to the AI era.

4. Future Legal Policy

The rapid integration of Artificial Intelligence (AI) into Indonesia's labour market demands proactive, anticipatory legal and policy interventions to secure a fair and sustainable transition. Existing labour laws and social security regulations, though foundational, are not yet adequate to address the structural complexities introduced by AI—ranging from large-scale job displacement and algorithmic management to the proliferation of gig and platform-based work. Without timely reform, these developments risk deepening labour-market segmentation, widening income inequality, and undermining social cohesion.[31]

Future legal policy should embed principles of responsible innovation within labour regulation. This implies shifting from reactive compliance to anticipatory governance, ensuring technological adoption does not erode fundamental labour rights. Clear employer obligations regarding workforce adaptation ought to be codified—most notably mandatory reskilling and retraining for employees affected by automation—to operationalize a "just transition" consistent with emerging international labour standards. Absent these obligations, Indonesia risks persistent structural unemployment and heightened vulnerability among low-skilled workers.[32]

Expanding the scope and adequacy of social-security coverage is equally critical. Informal workers and gig-economy participants—who constitute a large share of Indonesia's workforce—remain under-protected by unemployment insurance, pensions, and vocational training. Integrating these workers through portable benefit accounts and contributory schemes tailored to irregular earnings would mitigate socio-economic risks from AI-induced displacement while strengthening labour-market resilience.[33]

[29] Ai Jun Hou et al., "From Employee to Entrepreneur: The Role of Unemployment Risk," *Journal of Financial Economics* 163 (January 2025): 103966, doi:10.1016/j.jfineco.2024.103966.
[30] Ahmet Karpuz et al., "The Effect of Labour Protection Laws on the Relationship between Leverage and Wages," *Journal of Banking and Finance* 148 (March 1, 2023), doi:10.1016/j.jbankfin.2022.106722.
[31] Hou et al., "From Employee to Entrepreneur: The Role of Unemployment Risk."
[32] Markus Leibrecht, Johann Scharler, and Yan Zhoufu, "Automation and Unemployment: Does Collective Bargaining Moderate Their Association?," *Structural Change and Economic Dynamics* 67 (December 1, 2023): 264–76, doi:10.1016/j.strueco.2023.08.006.
[33] Jingyuan Yu, Heyun Zhao, and Longjiong Mo, "Can Social Insurance Contributions Boost Labor Share?—Evidence from China's Social Insurance Law," *Economic Analysis and Policy* 80 (December 1, 2023): 701–15, doi:10.1016/j.eap.2023.09.016.

Legal frameworks must also confront how AI governs employment practices. Algorithmic decision-making in recruitment, performance evaluation, and workforce allocation poses risks of bias, opacity, and misuse of personal data.[34] Regulatory clarity on transparency, accountability, and ethical standards for automated labour management—such as algorithmic audits, explainability requirements, and robust data protection aligned with privacy legislation—is essential to prevent rights violations and sustain trust in AI adoption.[35]

In addition to labour and social security reforms, fiscal policy must adapt to the realities of automation. The idea of a robot tax—a levy on companies that develop or deploy AI-driven technologies that replace human labour—is increasingly discussed as a creative instrument to address social and economic challenges from rapid technological change.[36] In Indonesia, scholars and policymakers have begun exploring the robot tax not only as a regulatory mechanism but also as a funding source for social protection, including unemployment insurance, to redistribute automation's gains and support displaced workers.[37] A key motivation is that Indonesia's current tax system can inadvertently incentivize automation: capital-equipment deductions are often more favourable than wage-related costs, which erodes payroll-linked revenues that finance programmes such as BPJS Ketenagakerjaan and BPJS Kesehatan. A well-designed robot tax could help rebalance incentives and ensure firms benefiting from automation contribute to the social safety net.[38]

To institutionalize this approach, Indonesia must revise its tax law to formally recognize the robot tax within its legal system, ensuring that companies deploying automation technologies contribute equitably to social protection funding. This revision should be accompanied by updates to Government Regulation No. 6 of 2025, which currently governs the Jaminan Kehilangan Pekerjaan (JKP) unemployment insurance scheme. Government Regulation No. 6/2025 already enhances benefit adequacy by replacing the previous tiered structure (45% and 25%) with a flat 60% of wages for up to six months. However, further amendments could use robot tax revenue to increase the benefit duration or percentage, and more importantly, extend JKP coverage to informal workers, who are currently excluded but highly vulnerable to automation-induced displacement.[39]

Beyond cash benefits, robot-tax proceeds could finance a national training and reskilling programme geared to high-risk sectors, offering modular, stackable credentials and using real-time labour-market analytics to align training with demand. By linking fiscal innovation to workforce development, Indonesia can transform automation from a source of vulnerability into an opportunity for inclusive growth.[40]

Policy design should prioritize multi-stakeholder collaboration—government, industry, labour unions, and civil society—to craft adaptive, inclusive legal structures that anticipate technological change

[34] Gaaitzen J. de Vries et al., "The Rise of Robots and the Fall of Routine Jobs," *Labour Economics* 66 (October 1, 2020), doi:10.1016/j.labeco.2020.101885.
[35] Victor Hernandez Martinez and Kaixin Liu, "The Value of Unemployment Insurance: Liquidity vs. Insurance Value," *Labour Economics* 93 (April 1, 2025), doi:10.1016/j.labeco.2025.102691.
[36] Adrián Popovič and Jozef Sábo, "Taxation of Robots and AI-Problem of Definition," *Financial Law Review1* 25, no. 1 (2022).
[37] Gizem Akar, Giorgia Casalone, and Martin Zagler, "You Have Been Terminated: Robots, Work, and Taxation," *International Review of Economics* 70, no. 3 (September 1, 2023): 283–300, doi:10.1007/s12232-023-00419-6.
[38] Roberta F Mann, "I Robot: U Tax? Considering the Tax Policy Implications of Automation," *McGill Law Journal* 64, no. 4 (2019): 705–806.
[39] Joao Guerreiro, Sergio Rebelo, and Pedro Teles, "Should Robots Be Taxed?," *The Review of Economic Studies* 89, no. 1 (2019): 279–311, doi:https://doi.org/10.1093/restud/rdab019.
[40] Robert J Kovacev, "A Taxing Dilemma: Robot Taxes and the Challenges of Effective Taxation of AI, Automation and Robotics in the Fourth Industrial Revolution," *The Contemporary Tax Journal* 9, no. 2 (July 13, 2020), doi:10.31979/2381-3679.2020.090204.

rather than merely react to it.[41] Embedding social dialogue and participatory governance into reform processes will help transform AI from a source of disruption into a catalyst for equitable growth and sustainable employment. A coherent Indonesian strategy—integrating labour rights, expanded social security, algorithmic accountability, and fiscal innovation—will be indispensable to ensure technological progress aligns with fairness, social justice, and long-term development.

CONCLUSION

Artificial Intelligence is reshaping Indonesia's labour market, creating both opportunities and challenges. While AI can generate new forms of employment, it also poses significant risks of job displacement, particularly for low- and medium-skilled workers. Current Indonesian labour laws and social security systems provide foundational protections but are insufficient to address the structural disruptions caused by automation. Progressive legal reform (revising tax law and government regulation on unemployment programme) is needed to integrate principles of responsible innovation, extend social protection to informal and gig workers, and mandate reskilling and retraining programs. By adopting anticipatory, inclusive, and adaptive legal policies, Indonesia can balance technological advancement with worker protection, ensuring that the benefits of AI are shared broadly and equitably across society.

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