BORJUIS: JOURNAL OF ECONOMY
Vol. 3 No. 3 Mei 2026, hal. 37-49 e-ISSN: 3030-931X

THE IMPACT OF THE DIGITAL ECONOMY ON THE GROWTH OF SMES AND THE LABOUR MARKET STRUCTURE IN INDONESIA

Tehedi
Universitas Sultan Muhammad Syafiuddin Sambas

Ahmad Rizani
Jurusan Ekonomi Pembangunan Universitas Palangka Raya
ahmadrizani@gmail.com

ABSTRACT

The digital economy has become a key transformative force in the Indonesian economy, with growth reaching 8.6% and a contribution of 8.4% to GDP in 2024. This study aims to analyse the impact of the digital economy on the growth of SMEs and the labour market structure in Indonesia using a literature review method with a descriptive qualitative approach. The results indicate that the digital economy has a significant positive impact on SME growth, with 70% of SME operators experiencing an increase in revenue of up to 30% after joining the digital ecosystem, and SME growth reaching 83% by 2024. Digitalisation opens up broader market access, improves operational efficiency by reducing marketing costs by up to 42.68%, and provides access to alternative financing through P2P lending fintech platforms, which have channelled Rp37.9 trillion to SMEs. However, the digital transformation of SMEs still faces challenges, including low technology adoption (only 24–26%), low digital literacy (only 18% possess basic digital skills), and limited internet infrastructure (76.8% penetration). In terms of the labour market structure, the digital economy created 4.2 million direct jobs and 15.7 million indirect jobs in 2023, projected to rise to 6.5 million and 22 million by 2025, although 83 million jobs are predicted to be lost due to automation by 2025. The gig economy offers flexibility to 86.6 million workers (59.40% of the total workforce), yet it also creates economic uncertainty, with 28.4% of gig workers labouring 13–14 hours a day without adequate social protection. The digital skills gap remains a major obstacle, with only 1% of the workforce possessing advanced-level skills against a target of 50%. The study recommends strengthening vocational education curricula, implementing mass reskilling and upskilling programmes for 5 million digital talents by 2026–2030, developing equitable digital infrastructure, strengthening regulations to protect gig workers, and providing incentives for SMEs to undergo digital transformation.

Keywords: digital economy, SMEs, business growth, employment, gig economy, digital transformation, digital literacy, skills gap, automation, fintech

Introduction

The digital economy has become a key transformative force in the global economy, including Indonesia, with growth outpacing that of the conventional economy. Indonesia's digital economy recorded growth of 8.6 per cent between 2019 and 2024, exceeding the national economic growth rate of around five per cent. In 2024, the value of the digital economy market reached Rp1,860 trillion, equivalent to USD117.2

billion, contributing 8.4 per cent to GDP, up from 7.7 per cent in the 2010–2014 period (Tommy & Nasution, 2025) . This rapid growth is driven by the massive adoption of technology, increasing internet penetration, and a shift in consumer behaviour towards digital transactions.

Indonesia has over 64 million SMEs, which contribute 61% to the Gross Domestic Product (GDP) and employ 97% of the national workforce (AULIA, 2024) . According to the Ministry of Cooperatives and Small and Medium Enterprises (Kemenkop-UKM), SMEs account for 57.8% of Indonesia's total Gross Domestic Product (GDP). The strategic position of MSMEs as a main pillar of the national economy makes them a key focus in economic development policy, particularly in the context of the inevitable digital transformation of the 21st century.

The digitalisation of SMEs is estimated to increase Indonesia's GDP by up to Rp2,433 trillion by 2024 and contribute to post-Covid-19 economic recovery (Hamsal et al., 2024) . The 2020 Asia Pacific SMB Digital Maturity Study estimates that the digitalisation of SMEs in Indonesia could increase Gross Domestic Product (GDP) by US$160–164 billion by 2024 (Rismawati et al., 2025) . This immense economic potential demonstrates that digital transformation is not merely an option, but a strategic necessity to strengthen the competitiveness of SMEs in an increasingly interconnected global market (Bowo, 2023) .

The digital transformation of SMEs in Indonesia is crucial for enhancing competitiveness and sustainability in the digital economy era; however, SMEs face significant challenges, including low digital literacy, limited financial resources, uneven digital infrastructure, and inadequate regulatory support (Novyana et al., 2024) . Digitalisation has emerged as a key trend in economic development at both the global and national levels, and as a vital pillar of the Indonesian economy, SMEs are expected to adapt to these changes. The success of leveraging the digital economy is heavily influenced by internal factors such as adaptability and a willingness to learn, as well as external factors including government support and access to training (Bowo, 2023) .

Research indicates that digital transformation has a positive and significant impact on the performance of SMEs in Indonesia. Multiple linear regression analysis reveals that a one-unit increase in the digital transformation variable results in a 1.5-unit increase in SME performance. Factors influencing technology adoption by SMEs include internet access, digital literacy levels, and government support, where high internet access and good digital literacy, coupled with strong government support, are crucial for enhancing technology adoption and maximising the benefits of digital transformation (Rismawati et al., 2025) .

The digital economy plays a vital role in job creation in Indonesia. According to data from the Ministry of Manpower (2023), the digital economy created approximately 4.2 million direct jobs and 15.7 million indirect jobs in 2023. These figures are projected to continue rising, reaching 6.5 million direct jobs and 22 million indirect jobs by 2025.

The sectors contributing most significantly to job creation in the digital economy include e-commerce and online retail (32%), the gig economy and digital work platforms (24%), logistics and delivery (18%), fintech and digital financial services (15%), and other digital sectors (11%) (Mulyati, 2025) .

The gig economy phenomenon is becoming increasingly prevalent in Indonesia alongside the development of technology platforms that facilitate project-based work. According to data from the Central Statistics Agency (BPS) as of February 2025, approximately 59.40 per cent, or 86.6 million workers in Indonesia, rely on the informal sector for their livelihoods, including gig economy workers (Tommy & Nasution, 2025) . The latest BPS data indicates that there are approximately 84.2 million informal workers, with 41.6 million of them being gig workers or freelancers, the majority of whom are from the millennial and Generation Z cohorts (Rismawati et al., 2025) . The number of freelance workers in Indonesia reached 46.47 million people, accounting for 32% of the total labour force of 146.62 million as of February 2023, a significant increase compared to 2022 figures, which stood at 34 million people or 24% (Syandika et al., 2025).

Although the open unemployment rate (TPT) fell from 4.82% to 4.76% as of February 2025, the absolute number of unemployed people actually rose slightly from 7.20 million to 7.28 million. Amidst a wave of redundancies that rose by 20.21% throughout 2024, many workers who lost formal jobs turned to digital platforms such as Gojek, Grab, ShopeeFood, TikTok Shop, and online trading. Digital platforms have provided a quick solution for those affected by redundancies, particularly in major cities; however, these jobs often involve long working hours, unpredictable income, and a lack of social protection (McAfee & Brynjolfsson, 2017) .

Surveys indicate that around 28.4% of gig workers work 13–14 hours a day, and a further 24.4% work 11–12 hours, with only a small proportion working fewer than 8 hours (Wu & Huang, 2024) . Around 35.89% of the Indonesian workforce still have an education level of primary school or below, making it difficult for them to access jobs with decent wages and better working conditions. This phenomenon highlights a paradox where the digital economy creates jobs but also has the potential to create low-quality jobs and exploitative working conditions.

Digitalisation is a key element in enhancing the competitiveness of SMEs in Indonesia, particularly within the context of an increasingly interconnected global economy. This study aims to explore the impact of digitalisation on SME economic growth, including improved market access, operational efficiency, and access to alternative financing through financial technology (fintech) (Ananda et al., 2026) . Although digitalisation offers many opportunities, SMEs also face challenges such as limited access to technology, low digital literacy, a lack of government support, and concerns regarding data security (Ananda et al., 2026) .

Low levels of digital and financial literacy remain major barriers for SMEs, particularly in the use of artificial intelligence (AI) to support marketing and business

management. SMEs often face various challenges in adopting digital technology, such as limited resources, a lack of digital knowledge and skills, and inadequate infrastructure (Anwar & Nurrohman, 2025) . The adoption of digital technology can open up wider access to markets and financing, yet the digital divide remains a challenge, ranging from low digital literacy to infrastructure limitations and trust in digital systems (Ananda et al., 2026) .

Based on the above, this research is important to conduct in order to comprehensively analyse the impact of the digital economy on the growth of MSMEs and the structure of the labour market in Indonesia.

Research Method

This study employs a literature review (library research) using a descriptive qualitative approach to analyse the impact of the digital economy on the growth of SMEs and the structure of the labour market in Indonesia. Data sources were obtained from a review of national and international journals and other documents relevant to the research theme. The data collected includes primary data in the form of previous empirical research findings and secondary data in the form of economic statistics, figures on SME involvement in the digital economy, technology adoption rates, employment data, and gig economy trends. The data analysis technique used is content analysis, involving the identification, classification, synthesis, and interpretation of findings from various literature sources to address the research questions. The advantage of this method is its ability to provide a comprehensive overview of the research phenomenon from various perspectives and across different time periods, whilst its limitation lies in its dependence on the availability and quality of existing literature (Patten, 2016) ; (Eliyah & Aslan, 2025) .

Results and Discussion

The Impact of the Digital Economy on the Growth of SMEs in Indonesia

The digital economy has emerged as a catalyst for fundamental transformation for Indonesian SMEs, opening up far broader market access compared to conventional methods. Research indicates that the digital economy provides opportunities for SMEs to enhance competitiveness, access wider markets, and significantly reduce operational costs (Rukaiyah et al., 2025) . Digital platforms such as Tokopedia, Shopee, Bukalapak, and TikTok Shop enable SMEs to reach consumers not only at the national level but also in international markets without the need to open physical branches in various locations. This market expansion directly contributes to increased sales volumes and revenue for SMEs, which ultimately drives faster business growth compared to before adopting digital technology.

One of the most tangible impacts of the digital economy on SMEs is a significant increase in revenue following their integration into the digital ecosystem. According to

a survey by the Centre of Reform on Economics (CORE), approximately 70% of SME operators experienced a revenue increase of up to 30% after joining the digital ecosystem (Syandika et al., 2025) . Data from CPA Australia indicates that in 2024, 68 per cent of Indonesian small businesses that invested in technology reported an increase in their profitability, a result that places Indonesia in third place out of the 11 markets surveyed. This increase in sales is also evident from data showing that in 2024, 74 per cent of small businesses reported that more than 10 per cent of their sales were generated through digital technology, a significant increase from 54 per cent prior to the Covid-19 pandemic (Hamsal et al., 2024) .

The digitalisation of SMEs creates tangible operational efficiencies through reduced marketing costs, improved inventory management, and the automation of business processes. The implementation of digital marketing in SMEs has resulted in a higher level of marketing cost efficiency, standing at 42.68% for the period August–December 2023 (AULIA, 2024) . The internet provides efficiency for business owners in marketing small and medium-sized enterprise products due to its wide reach, ease of access, and low costs. SMEs that utilise digital marketing to promote their products result in a more effective and efficient marketing process, lower promotional operational costs, and the potential for higher product sales volumes, thereby offering a significant opportunity to increase revenue (Java Widodo, 2022) .

The digital economy opens up access to alternative financing for SMEs through peer-to-peer (P2P) lending fintech platforms, which are faster and more accessible than conventional banking. Bank financing to the SME sector as of December 2024 stood at Rp1,405 trillion, growing at a slower rate of 3% year-on-year (yoy), whilst outstanding online loan financing to the SME segment as of November 2024 grew by 14.7% yoy to Rp24.46 trillion (Herdianto & Satory, 2025) . The OJK targets 40% of P2P fintech funding to flow into the productive sector and SMEs by 2024; as of January 2024, SMEs had already received funding worth Rp20.33 trillion (Java Widodo, 2022) . The growth in financing to the SME sector from P2P lending fintech is greater than that of bank credit, with annual growth rates of 32.87 per cent and 4.3 per cent respectively (Bowo, 2023) .

In 2024, Indonesia's MSMEs recorded growth of 83%, the highest since the pandemic, and are predicted to reach 87% in 2025 (Hamsal et al., 2024) . According to data from the Ministry of Cooperatives and SMEs for 2023, around 22 million MSME operators have gone digital—a figure that reflects rapid progress compared to previous years. Accounting for 99% of all business units, MSMEs constitute the dominant sector in Indonesia's economic structure. Currently, the Indonesian Chamber of Commerce and Industry (Kadin Indonesia) and the Indonesian Government are driving improvements in the performance of national MSMEs through a digitalisation strategy aimed at enhancing competitiveness, becoming global players, and fostering an export-oriented approach (Anwar & Nurrohman, 2025) .

Digitalisation brings a range of tangible opportunities for SMEs: efficient online transactions, access to national and global markets, cost-effective promotion via social media, and increasingly precise sales analytics (Java Widodo, 2022) . Platforms such as Instagram, Facebook, and e-commerce apps like Tokopedia and Shopee enable SMEs to reach consumers both nationally and internationally. Furthermore, digital technology drives product and service innovation, accelerates collaboration among business operators, and creates mutually supportive business networks. SMEs from various regions can thrive provided they possess creative ideas, innovation, and the ability to adapt to the dynamics of the digital economy (Manuhutu et al., 2025) .

Although the potential benefits of the digital economy are immense, the level of technology adoption among SMEs remains relatively low. Only 24% of SMEs have optimally utilised digital platforms for product marketing and distribution (Kompasiana, 2024). The growth of SMEs in this digital era is exponential, yet only 26 per cent of the 64 million SMEs have transitioned to digital platforms (AULIA, 2024) . According to data from the Ministry of Cooperatives and SMEs in 2024, around 35% of SMEs in Indonesia have not yet optimally utilised digital technology in their business operations (Manuhutu et al., 2025) . This gap indicates that there remains significant potential for accelerating the digitalisation of SMEs in the future.

Low digital literacy is a major barrier to the adoption of digital technology by MSMEs. According to a survey conducted by the Ministry of Communication and Information Technology (Kominfo) in 2024, only around 18% of MSME operators possess basic digital skills such as the use of e-commerce applications or social media to market their products. Data from the Ministry of Cooperatives and SMEs notes that although there has been an increase in awareness of the importance of digitalisation, around 40% of SMEs in Indonesia still lack adequate access to digital training and knowledge (Nisa et al., 2025) . Research concludes that the success of SMEs in utilising the digital economy is heavily influenced by internal factors, such as adaptability and a willingness to learn, as well as external factors, including government support and access to training (Herdianto & Satory, 2025) .

Limitations in digital infrastructure pose a significant challenge to the digitalisation of SMEs in Indonesia. Internet penetration in Indonesia stands at just 76.8 per cent, ranking 15th in Asia, as many areas remain without adequate internet connectivity. In addition to the uneven availability of infrastructure, Indonesia also faces another challenge, namely the rise of cybercrime, which threatens SME operators who are not yet digitally literate (Indonesia, 2022) . Not all SMEs possess the necessary infrastructure for digitalisation due to capital constraints, given the uneven distribution of digital infrastructure—such as internet access—across Indonesia, even on Java, and the fact that the cost of smartphones is still considered too high for the lower-middle class.

Limited capital poses a major obstacle for SMEs looking to expand in the digital age. Investment in digital marketing, new technologies, and IT infrastructure requires substantial funds, which small-scale SMEs often lack. Many still feel unfamiliar with the use of e-commerce platforms, social media, or business management software because not all SME operators have sufficient understanding of digital technology (Rukaiyah et al., 2025) . Furthermore, as many as 50 per cent of small businesses reported losses due to cyberattacks in 2024, exceeding the survey average of 40 per cent, which adds to the risks associated with the adoption of digital technology (Hamsal et al., 2024) .

Other challenges include fierce market competition and a shortage of skilled labour in the digital age. The digital economy presents many opportunities for SMEs, including access to wider markets through e-commerce platforms, reduced operational costs through online business models, and effective promotion via social media (Nisa et al., 2025) . However, challenges such as a shortage of skilled labour and intense market competition must also be addressed to optimise the benefits of the digital economy. To optimise the benefits of the digital economy, SMEs need to enhance their digital skills and leverage government support as well as innovation in marketing and operational strategies (Rukaiyah et al., 2025) .

By adapting swiftly to changes in the digital economic landscape, SMEs can accelerate growth, enhance competitiveness, and remain relevant in this increasingly digital era. The digitalisation of SMEs has proven to be a driver of inclusive economic growth, helping small businesses to compete in broader markets (AULIA, 2024) . To this end, synergy is required between business operators, the government, and digital platforms to build an ecosystem that supports the sustainable growth of SMEs in the digital era (Herdianto & Satory, 2025) . The government, through programmes such as UMKM Go Digital, the National Digital Literacy Movement, and partnerships with platforms like Tokopedia and Shopee, continues to drive the acceleration of this digitalisation (Novyana et al., 2024) .

The Impact of the Digital Economy on the Labour Market Structure in Indonesia

The digital economy has fundamentally transformed Indonesia's labour market structure, influencing labour demand, required skills, and increasingly flexible working patterns. Literature-based studies and secondary data indicate a significant shift from conventional jobs to technology- and digital platform-based roles, such as ride-hailing and e-commerce (Nisa et al., 2025) . The technology and digital services sectors are growing rapidly, with annual growth exceeding 15%, whilst traditional sectors such as conventional manufacturing and offline retail are experiencing a decline in labour demand. This structural transformation is creating a new paradigm in the labour market in Indonesia, where digital skills have become a key prerequisite for securing quality employment.

The digital economy plays a vital role in job creation in Indonesia, with a significant impact on labour absorption. According to data from the Ministry of Manpower (2023), the digital economy created approximately 4.2 million direct jobs and 15.7 million indirect jobs in 2023. These figures are projected to continue rising, reaching 6.5 million direct jobs and 22 million indirect jobs by 2025. The sectors contributing most significantly to job creation in the digital economy include e-commerce and online retail (32%), the gig economy and digital work platforms (24%), logistics and delivery (18%), fintech and digital financial services (15%), and other digital sectors (11%) (Geliskhanov, 2018) . This job creation represents a significant contribution by the digital economy towards reducing unemployment and improving public welfare.

The emergence of new jobs based on revolutionary technology has drastically transformed Indonesia's employment landscape. Jobs such as software developers, data analysts, digital marketing specialists, and content creators are experiencing extremely rapid growth in demand within the Indonesian labour market. The Economic Journal's indicators reveal that, firstly, the emergence of new technology-based jobs indicates high demand for digital skills that were previously in short supply (Park & Shin, 2025) . Nearly 50% of jobs in Indonesia will undergo significant transformation due to digitalisation by 2030, and 25% of new jobs will emerge as a result of digital innovation (Mulyati, 2025) . These jobs offer higher salaries, flexible working hours, and broader career development opportunities compared to conventional jobs.

Conversely, routine conventional jobs are declining due to increasingly widespread automation and digitalisation. The World Economic Forum (2023) reports that whilst 83 million jobs will be lost to automation by 2025, an estimated 69 million new jobs will be created, focusing more on technological innovation, data management, and other high-skill roles. Jobs such as cashiers, machine operators, administrative staff, and conventional drivers are examples of roles easily replaceable by more efficient and cost-effective algorithms and AI systems (Pattiasina et al., 2025) . Based on the findings, approximately 56% of jobs in Indonesia are at high risk of automation, particularly in the manufacturing and agricultural sectors, which still dominate labour absorption (Fuei, 2017) . This disruption creates significant pressure on workers who do not yet possess adequate digital skills to adapt.

The digital skills gap is a major challenge hindering the optimal utilisation of the digital economy for Indonesia's workforce. The World Economic Forum (2020) notes that only around 50% of Indonesia's workforce possess basic digital skills, whilst the number with intermediate and advanced skills remains very low. The proportion of Indonesian workers with advanced digital skills does not even reach 1% (Pattiasina et al., 2025) . Research findings indicate that although the government aims for 50% of workers to possess intermediate and advanced digital skills by 2024, the current workforce consists of only 50% with basic to intermediate skills, with advanced skills accounting for less than 1%. This gap has led to many digital job vacancies remaining

unfilled, whilst the open unemployment rate remains high, indicating a mismatch between workforce competencies and labour market needs (Anabuni et al., 2025) .

The gig economy phenomenon has a paradoxical impact on Indonesia's employment structure, creating work flexibility yet also economic uncertainty for workers. The Covid-19 pandemic and a 20.21% rise in redundancies throughout 2024 have driven many formal sector workers to switch to digital platforms such as Gojek, Grab, ShopeeFood, and TikTok Shop (Wu & Huang, 2024) . Nearly 59.40 per cent, or 86.6 million workers in Indonesia, rely on the informal sector for their livelihoods, including gig economy workers. Around 28.4% of gig workers work 13–14 hours a day, and a further 24.4% work 11–12 hours; only a small proportion work fewer than 8 hours (Wood et al., 2019) . Although offering flexibility, these jobs often come with unpredictable income and a lack of adequate social protection, creating long-term economic vulnerability for workers.

Digital transformation also impacts social and economic inclusion by providing opportunities for marginalised groups to access the labour market. Many individuals who were previously marginalised now have access to employment opportunities through online platforms. For example, freelancers can reach clients worldwide via websites such as Upwork and Fiverr, providing an opportunity for those without access to traditional employment to earn an income (Purbasari et al., 2025) . The existence of digital platforms such as e-commerce and marketplaces provides opportunities for individuals and small businesses to sell their goods and services to a wider market, without geographical constraints. This helps to increase economic participation among vulnerable groups such as women, rural communities, and micro-entrepreneurs who were previously marginalised from the formal economy.

Inequalities in access to digital skills and technology create a digital divide that widens the economic gap between regions and social groups. Nearly 40% of job seekers in rural areas are unable to utilise digital platforms due to poor internet access or a lack of technological understanding (Williams et al., 2020) . Low levels of digital literacy among informal workers and rural communities leave them behind in the online job search process. Consequently, the digitalisation of the labour market has the potential to widen the gap between highly educated and less educated workers, creating a digital divide in access to job opportunities (van Doorn et al., 2023) . This gap is also evident geographically, with major cities in Java being far better prepared to face digital transformation compared to regions outside Java.

Education and training are key factors in preparing the workforce for the ever-evolving digital era. Surveys indicate that only 27% of university graduates feel fully prepared to work in the digital industry (Rismawati et al., 2025) . Other research reveals that 45% of vocational school graduates in West Java are unemployed because the curriculum remains 'outdated', far removed from Python, data analytics, or IoT—skills required by Industry 4.0. Nearly 70% of e-commerce workers who were made redundant

failed to secure new employment due to an inability to adapt their skills (Maora, 2025) . The Ministry of Industry aims to develop 5 million digital talents between 2026 and 2030 to address this gap, but implementation remains hampered by infrastructure and budgetary constraints.

The government, industry and educational institutions need to collaborate in preparing an adaptive workforce that is ready to face the digital age, to ensure that digital transformation is inclusive, fair and sustainable. Adaptive policies are required so that the workforce can keep pace with developments and the digital economy can bring widespread benefits to society. An integrated policy strategy is needed to ensure that digital transformation is inclusive, fair and sustainable for the entire Indonesian workforce, including the strengthening of vocational education curricula, mass reskilling and upskilling programmes, and the development of a digital training ecosystem that is accessible in regional areas (Maora, 2025) . Collaboration between the government, the business sector, and educational/training institutions is essential in preparing an adaptive workforce ready to face the digital era (Purbasari et al., 2025) . Without appropriate policy interventions, the risks of skills gaps and economic inequality resulting from digital transformation will continue to escalate.

Conclusion

The digital economy has had a significant positive impact on the growth of SMEs in Indonesia, with 70% of SME operators experiencing an increase in revenue of up to 30% after joining the digital ecosystem, and SME growth reaching 83% in 2024—the highest since the pandemic. Digitalisation opens up broader market access, even at an international level, improves operational efficiency by reducing marketing costs by up to 42.68%, and provides access to alternative financing through P2P lending fintech, which grew by 14.7% with Rp37.9 trillion channelled to SMEs. However, the digital transformation of SMEs still faces significant challenges, including the fact that only 24–26% of SMEs have optimally adopted digital technology, low digital literacy where only 18% of SME operators possess basic digital skills, and limited internet infrastructure that currently reaches only 76.8% of the population and remains constrained by geographical disparities.

The digital economy is fundamentally reshaping Indonesia's labour market by creating 4.2 million direct jobs and 15.7 million indirect jobs in 2023, projected to rise to 6.5 million and 22 million by 2025, although on the other hand, 83 million jobs are predicted to be lost due to automation by 2025. The emergence of new technology-based jobs such as software developers, data analysts, and content creators is seeing high demand, whilst conventional, routine jobs such as cashiers and machine operators are at high risk of being replaced by automation, with 56% of jobs in Indonesia at risk of automation. The gig economy phenomenon demonstrates a paradoxical impact by providing flexibility for 86.6 million workers (59.40% of the total workforce), yet it also

creates economic uncertainty, with 28.4% of gig workers labouring 13–14 hours a day on unpredictable incomes and without adequate social protection.

Successfully harnessing the digital economy for SME growth and the creation of quality jobs requires tripartite synergy between the government, industry, and educational institutions to address the digital skills gap and ensure an inclusive transformation. The digital skills gap remains a major obstacle, with only 1% of Indonesia's workforce possessing advanced digital skills—far short of the 50% target for 2024—while 45% of vocational school graduates are unemployed due to curricula that do not align with the needs of Industry 4.0. Policy recommendations include strengthening vocational education curricula relevant to the digital industry, mass reskilling and upskilling programmes for 5 million digital talents by 2026–2030, the development of equitable digital infrastructure extending to remote areas, strengthening regulations to protect gig workers, and incentives for SMEs to undergo digital transformation through the 'SMEs Go Digital' programme and collaboration with major digital platforms.

References

Anabuni, A. U. T., Dewiaty, I. L., Kellen, M. S. L., Himpi, P. jono karjo, & Mooy, D. (2025). Peluang Dan Tantangan Umkm Di Era Digital: Solusi Praktis Untuk Masyarakat Amanuban Barat: Pengabdian. *Jurnal Pengabdian Masyarakat Dan Riset Pendidikan*, *3*(4), 2133–2138. https://doi.org/10.31004/jerkin.v3i4.728

Ananda, C., Saepudin, S., Wahjoedi, T., Pamudya, O. A. A., & Putra, A. A. (2026). Adaptasi Strategi Bisnis UMKM Indonesia terhadap Ketidakpastian Ekonomi Global dan Kebijakan Perpajakan 2026. *RIGGS: Journal of Artificial Intelligence and Digital Business*, *5*(1), 9836–9844. https://doi.org/10.31004/riggs.v5i1.7398

Anwar, K., & Nurrohman, R. (2025). Strategic HR Agility In Southeast Asian MSMES: A Cross-Country Study Of Indonesia, Vietnam, And The Philippines Amidst Digital Transformation. *JURNAL MANAJEMEN DAN BISNIS*, *4*(2), 432–452. https://doi.org/10.36490/jmdb.v4i2.1980

AULIA, E. (2024). IMPLEMENTASI DIGITAL MARKETING DALAM EFISIENSI BIAYA PEMASARAN PADA UMKM PONDOK AYAM KREMES RIZKI PALEMBANG. *KARIMAH TAUHID Учредители: Universitas Djuanda*, *3*(11), 12203–12212.

Bowo, F. A. (2023). Penguatan UMKM Melalui Pembayaran Digital: Strategi Digital Marketing Dalam Era Baru. *Jurnal Studi Interdisipliner Perspektif*, *22*(2), 134–140.

Eliyah, E., & Aslan, A. (2025). STAKE'S EVALUATION MODEL: METODE PENELITIAN. *Prosiding Seminar Nasional Indonesia*, *3*(2), Article 2.

Fuei, L. K. (2017). Automation, Computerization and Future Employment in Singapore. *Journal of Southeast Asian Economies*, *34*(2), 388–399.

Geliskhanov, I. Z. (2018). *DIGITAL PLATFORM: A NEW ECONOMIC INSTITUTION* (SSRN Scholarly Paper No. 3297290). Social Science Research Network. https://papers.ssrn.com/abstract=3297290

Hamsal, H., Hidayat, Saiful, & Hanafi, I. (2024). PELATIHAN PENGELOLAAN SDM DI ERA DIGITAL PADA UMKM DI DESA TANAH MERAH: -. *IJTIMA': JURNAL PENGABDIAN MASYARAKAT*, *1*(1), 10–15. https://doi.org/10.25299/ijtima.2024.16768

Herdianto, H., & Satory, A. (2025). Hukum Bisnis dalam Pengembangan UMKM di Indonesia Kepastian Hukum, Tantangan, dan Solusi. *Jurnal Sosial Dan Sains*, *5*(10), 7460–7466. https://doi.org/10.59188/jurnalsosains.v5i10.32549

Indonesia, B. (2022). *Keterbatasan Infrastruktur Jadi Tantangan Digitalisasi UMKM*. ANTARA News. https://www. antaranews. com/berita/2929621/bi ….

Java Widodo, 1821011033. (2022). *PENGARUH LITERASI KEUANGAN, PENGGUNAAN DIGITAL FINANCIAL PRODUCT, DAN PENGGUNAAN INTERNET TERHADAP INKLUSI KEUANGAN PADA PELAKU UMKM DI KOTA BANDAR LAMPUNG* [Masters, UNIVERSITAS LAMPUNG]. https://digilib.unila.ac.id/63525/

Manuhutu, F. Y., Noer, E., Nahumury, M. A. I., Fangohoy, A., Lewaherilla, E. D., Wati, C. H. S., & Irianto, O. (2025). *Kewirausahaan Umkm Di Era Digital: Peluang, Tantangan, dan Solusi Inovatif*. Star Digital Publishing.

Maora, R. M. (2025). Optimalisasi Model Machine Learning Dalam Upaya Penyesuaian Kompetensi Tenaga Kerja Indonesia terhadap Tuntutan Pasar Kerja Digital di Era Peralihan Revolusi Industri 4.0 Menuju Society 5.0. *Cipasung Techno Pesantren: Scientific Journal*, *19*(2). https://journal.sttcipasung.ac.id/index.php/CTP/article/view/105

McAfee, A., & Brynjolfsson, E. (2017). *Machine, Platform, Crowd: Harnessing Our Digital Future*. W. W. Norton & Company.

Mulyati, D. (2025). IMPLEMENTING CONSUMER PROTECTION LAW IN DIGITAL ECONOMY: LEGAL RESPONSIBILITIES OF E-COMMERCE DELIVERY SERVICE PROVIDERS. *International Journal of Economics, Education, Law and Social Sciences (IJEELSC)*, *1*(2), 124–132. https://doi.org/10.61990/qjzhjm51

Nisa, K., Alia, N., & Fitrini, W. (2025). PERAN EKONOMI KREATIF DALAM MENINGKATKAN DAYA SAING UMKM DI ERA DIGITAL. *Seminar Nasional Pariwisata Dan Kewirausahaan (SNPK)*, *4*, 250–258. https://doi.org/10.36441/snpk.vol4.2025.335

Novyana, H., Clarence, J., Sonya, A. P., Halikha, N., Putri, E. T., & Marchela, A. (2024). STRATEGI PENDAFTARAN MEREK DAGANG SERTA REALISASI MEREK UNTUK MENINGKATKAN REPUTASI PELAKU USAHA MIKRO KECIL MENENGAH (UMKM) BERDASARKAN UNDANG-UNDANG MEREK DAN INDIKASI GEOGRAFIS DI DAERAH JAKARTA SELATAN. *Jurnal Kreatif : Karya Pengabdian untuk Masyarakat Aktif dan Inovatif*, *1*(01), 32–51. https://doi.org/10.64578/jkreatif.v1i01.16

Park, J., & Shin, B. (2025). Conceptualizing Digital Sanctions as a New Type of Economic Sanctions in the Digital Era: Digital-Related Sanctions Measures Against Russia and Their Consequences. *Journal of Eurasian Studies*, *16*(1), 44–59. https://doi.org/10.1177/18793665231217303

Patten, M. L. (2016). *Understanding Research Methods: An Overview of the Essentials* (9th ed.). Routledge. https://doi.org/10.4324/9781315266312

Pattiasina, R. Y., Surya, J., Nasori, A., Saununu, S. J., Faisal, M., Yusriadin, Y., Arifin, H. M., Regar, E., Pamela, K., Sirait, R. M., Nova, S. M., & Kusmendar, K. (2025). *Manajemen UMKM di Era Digital*. Yayasan Tri Edukasi Ilmiah.

Purbasari, R., Munajat, E., Fauzan, F., & Hakim, M. A. (2025). Model of Digital Collaboration Network in Digital Innovation Context: Social Network Analysis Approach. *Review of Integrative Business and Economics Research*, *14*(1), 614–633.

Rismawati, Nasrullah, Setiawan, A., Maharani, D., & Soliha, I. (2025). Pelatihan Pengelolaan SDM Di Era Digital Pada UMKM Di Perumahan Mega Regency Kabupaten Bekasi. *Jurnal Ilmu Manajemen Dan Pendidikan | E-ISSN : 3062-7788*, *2*(2), 634–640.

Rukaiyah, S., Mujahid, Suyuthi, N. F., & Majid, A. (2025). *INOVASI UMKM "MENCIPTAKAN PELUANG DI ERA DIGITAL."* TOHAR MEDIA.

Syandika, M. A., Rahmayanti, Harahap, I. A., Suhardiman, T. A., & Purba, J. (2025). Transformasi Hukum Ketenagakerjaan di Era Digital: Menjawab Tantangan Perlindungan Hak Pekerja di Era Ekonomi Digital. *EBJESMA: Journal of Law and Human Rights*, *1*(1), 4–8.

Tommy, S., & Nasution, M. I. P. (2025). EVALUASI MANAJEMEN RISIKO KEAMANAN SIBER PADA INFRASTRUKTUR DIGITAL PEMERINTAH: STUDI KASUS PUSAT DATA NASIONAL (PDN). *Jurnal Manajemen Ekonomi dan Bisnis*, *4*(1), 1–26. (Studi kasus dokumentasi tanpa responden individu). https://doi.org/10.61715/jmeb.v4i1.104

van Doorn, N., Ferrari, F., & Graham, M. (2023). Migration and Migrant Labour in the Gig Economy: An Intervention. *Work, Employment and Society*, *37*(4), 1099–1111. https://doi.org/10.1177/09500170221096581

Williams, C., Llobera Vila, M., & Horodnic, A. (2020). *Tackling Undeclared Work in the Collaborative Economy and Bogus Self-Employment* (SSRN Scholarly Paper No. 3707054). Social Science Research Network. https://doi.org/10.2139/ssrn.3707054

Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019). Good Gig, Bad Gig: Autonomy and Algorithmic Control in the Global Gig Economy. *Work, Employment and Society*, *33*(1), 56–75. https://doi.org/10.1177/0950017018785616

Wu, D., & Huang, J. L. (2024). Gig work and gig workers: An integrative review and agenda for future research. *Journal of Organizational Behavior*, *45*(2), 183–208. https://doi.org/10.1002/job.2775

World Economic Forum. (2020). *The future of jobs report 2020*. World Economic Forum.

World Economic Forum. (2023). *The future of jobs report 2023*. World Economic Forum.

World Economic Forum. (2025). *The future of jobs report 2025*. World Economic Forum.