



**Industrial Relations in the Digital Age: Dynamics, Challenges,
and Opportunities**

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ARTICLE INFO	ABSTRACT
<p>Accepted : 9 March 2025 Revised : 9 April 2025 Approved: 9 May 2025</p> <p>Keywords: Industrial Relations, Digital Era, Industrial Revolution 4.0, Digital Transformation, Employment Dynamics, Challenges, Opportunities, Human Resource Management</p>	<p>The digital era has brought significant changes in the dynamics of industrial relations, creating various challenges as well as new opportunities. This article examines the dynamics of industrial relations in the digital era with a focus on digital transformation in dynamic industrial relations, looking at the challenges of industrial relations in the digital era, presenting significant challenges especially in labor management, while opening up significant opportunities for innovation and adapting industrial relations opportunities in the digital era. This article uses a literature review approach to analyze the Influence, Dynamics, Challenges, and Opportunities of industrial relations in the digital era. The results show that national industrial policies that focus on regulations and incentives still rely on traditional sectors, making them less prepared to face digital transformation and global competition.</p>

INTRODUCTION

Industrial relations in the digital era are closely linked to the Industrial Revolution 4.0, a period of digitalization that utilizes technology to connect various aspects through the internet. This digital era has brought about major transformations in work processes, production, communication, and interactions between workers and employers. Digitalization has shifted work systems from manual to automated, increasing efficiency. However, it also poses challenges such as job losses due to automation and robotization, as well as the risk of cybercrime. Technological developments such as artificial intelligence (AI) and automation have significantly impacted the relationship patterns between workers, employers, and the government, making these relationships more efficient and data-driven. This situation requires all parties to adapt in managing risks while seizing emerging opportunities in the context of work and employment relationships. Some emerging challenges include the possibility of weakening due to the replacement of human

labor with machines, the need to improve workforce skills, cybersecurity threats, and the need for supporting regulations and infrastructure. However, the digital era also presents opportunities such as creating new jobs, product and service innovation, increased productivity, and the development of digital technology-based businesses that can strengthen industrial relations and improve the welfare of workers and companies.

Technology can be a tool to reduce inequality and improve the quality of life, while simultaneously widening social and economic adaptation (Awaliyah, Oktaviana, Herlambang, 2024). Technology can be an important tool for improving workforce skills. However, there are several challenges that need to be overcome, such as limited access to technology, low technology adoption, and data security issues. Broadly speaking, this scientific article discusses how the industrial revolution 4.0 drives digital transformation in dynamic industrial relations, examines the challenges of industrial relations in the digital era, presents significant challenges, especially in workforce management, while opening up significant opportunities for innovation and adapting industrial relations opportunities in this digital era. With this approach, it is hoped that it can fill the gaps in the existing literature while providing practical and easy-to-implement recommendations.

LITERATURE REVIEW

Sub-Chapter

In the modern era marked by digitalization and flexible work (Gig Economy), the concept of industrial relations is also required to be more adaptive (Hanafi, 2024). Employers currently employ many project-based workers and freelancers, which causes difficulties in implementing conventional industrial relations. Therefore, a new approach is needed that is more flexible but still provides protection to workers to face these challenges. Legally, based on Law Number 13 of 2003 concerning employment, industrial relations is a form of system that measures the interaction between the parties involved in the work process, namely between workers or laborers and employers, with the support of the active role of the government, to create a fair, humane, and productive work atmosphere.

The rapid advancement of information technology has triggered major changes in the global economic structure, including in Indonesia. One of these changes is the growth of the digital economy, which utilizes online platforms to connect service providers with users (Handayani & Sangaviery, 2025). Digital development has driven the emergence of new technology-based jobs, such as online motorcycle taxis. Technological advancements have transformed the way people travel in their daily lives, with many people now using gadgets to order transportation services through online applications.

The Impact of Digitalization on Employment

Today, the world is undergoing significant transformations in the increasingly rapid production and distribution of goods and services, driven by technological advances. These innovations are shaping the future of industry and the labor market. The Industrial Revolution first began in England in the 18th to early 19th centuries, when machines replaced manual labor and enabled mass

production. Technological advances have made positive contributions to human well-being, creating new jobs, improving goods and services, and providing advancements in healthcare, travel, and communications (Hidayat & Fatma, 2024). However, technology also has disruptive impacts, affecting how companies operate and how labor is utilized. The fourth industrial revolution, currently underway, is likely to experience more rapid change than previous revolutions. Adapting to these changes may be more difficult, especially in the labor market. Technological advancements have a mixed effect on employment. As technology replaces jobs, some jobs disappear, and workers must develop new skills or learn to remain relevant in the labor market.

Technology can strengthen human resources by increasing productivity and driving demand for new products, services, and industries. This ultimately opens up broader and more diverse job opportunities. Technology can strengthen human resources by increasing work productivity and stimulating demand for products, services, and industries, which in turn creates new job opportunities. Some people worry about the impact of technology, especially in the form of the "gig economy," which can create gaps and increase inequality in employment. However, technology also provides new opportunities for business growth, increased productivity, and more efficient public services. Technology can also help companies grow faster, create jobs, blur the lines between producers, consumers, and service providers, and change the demand for worker skills. In some countries, investment in human resources has increased to meet technological demands, resulting in more efficient production and industrial growth. Thus, technology, while bringing change and uncertainty, also holds great potential for creating new jobs, increasing productivity, and transforming the way we work.

Dynamics of Industrial Relations in the Digital Era

Before the digital era, national industrial policy generally focused on three main elements: regulation, incentives, and a focus on the development of specific industrial sectors (Kongidah, Al-Qarni, Aprianto, 2024). Regulation serves to create a safe and orderly business climate that can encourage sustainable job creation and boost economic growth. The government regulates industrial activities to ensure production and distribution comply with established regulations and to maintain domestic market stability. The government acts as a supervisor and regulator to ensure competition among industry players. The rapid development of globalization and industry has had a significant impact on industrial relations (Khan, Pratama, Surahman, 2025). Furthermore, industrial policy utilizes incentives to encourage specific sectors such as manufacturing, energy, and agriculture to grow faster. These incentives take the form of subsidies, relief, taxes, or financial assistance aimed at increasing the production capacity and competitiveness of related industries. This policy places greater emphasis on creating industries capable of meeting domestic needs and supporting overall economic development. Before the digital era, industrial policy had several advantages that encouraged economic growth.

One of the main strengths of this policy is its success in creating jobs and reducing dependence on imported goods. The incentives provided to certain sectors also enabled development in strategic areas, thus supporting economic stability and increasing competitiveness in the domestic market. Furthermore, the regulations

implemented helped maintain market stability, thus reducing economic disruption. However, industrial policies before the digital era also had significant weaknesses. One of the main weaknesses of this policy is its reliance on traditional industrial sectors, which are less able to adapt to new technological advances. As global digitalization begins to develop rapidly, many countries that rely on this policy face difficulties in transforming. This unpreparedness is reflected in the inability of traditional industrial sectors to adopt digital technology, thus reducing competition in an increasingly fierce global market, forcing companies to increase innovation and efficiency to remain competitive. Furthermore, policies that focus too much on certain sectors often ignore the potential of new technology-based sectors, causing these countries to lag behind in terms of technological progress.

Industrial Relations Challenges in the Digital Age

In facing the challenges of industrial relations standards, they experience obstacles such as a shortage of skilled labor, accommodation difficulties and an unattractive industrial image for the younger generation (Fallah, Febriyanti, et al. 2025). Rapid technological changes and dynamic market demands require companies to adapt quickly, which impacts human resource management and industrial relations in the manufacturing sector. Therefore, companies must develop innovative and proactive strategies to face these challenges and maintain competitiveness and productivity. Rapid technological changes and market dynamics require companies to adapt quickly, which affects human resource management and industrial relations in the manufacturing sector. Therefore, companies need to implement innovative and proactive strategies to overcome these challenges and maintain competitiveness and productivity.

The Challenges of Transforming Industrial Relations Policy in the Digital Age Addressing the challenges of transforming industrial relations policy in the digital age is not easy. Several challenges must be addressed, including the following:

A. Adapting to New Technologies

Many countries that still rely on traditional industrial sectors face a significant challenge in the form of a digital divide (Hutahaean & Utama, 2024). This disparity can be seen between regions with good access to technology and those that lag behind. As a result, the transformation process is slower and uneven. Technologies such as artificial intelligence (AI), the Internet of Things (IoT), and big data require higher technical expertise and changes in working methods for greater efficiency. If this gap is not addressed promptly with serious action, a country will struggle to keep up with the rapid technological developments.

B. Human Resources

Rapid technological change demands that the workforce possess digital skills relevant to the needs of modern industry. However, many workers in traditional sectors lack the digital skills necessary to adapt to these technological developments. Therefore, the government needs to develop training programs that can help the workforce transition to skills more suited to the demands of the digital industry.

C. Infrastructure

Fast and stable internet connectivity is crucial to support digitalization in the industrial sector. However, in many countries, especially in remote areas, digital infrastructure remains limited. This hampers the adoption of new technologies that could improve efficiency and productivity. Without adequate infrastructure, it is difficult for industries to optimally implement technology-based operations. Furthermore, logistical support is crucial to ensure the smooth distribution of technology-based goods and services. A robust logistics infrastructure will help connect digital processes with distribution systems, supporting the transformation of industries to become more efficient and modern.

D. Regulation

To realize the digital era, the government needs to adjust existing regulations to be more flexible and able to keep up with the rapid development of technology. Regulations that are too rigid and filled with bureaucratic procedures can hinder innovation and the growth of new industrial sectors. Therefore, the government must implement policies that are more adaptive to technological change, capable of encouraging innovation while still protecting the interests of the public and the industrial sector. Furthermore, the government also needs to develop a legal framework that not only supports industrial transformation but also addresses challenges such as data security and privacy, which are increasingly important in this digital era.

Industrial Relations Opportunities in the Digital Age

Indonesia's Policy Transformation, as the largest economy in Southeast Asia, is at a crucial crossroads in its industrial history. The transformation of national policy toward the era of digital globalization offers tremendous opportunities. This digital era is not only changing how companies operate but also how industrial policies are formulated and implemented. The Indonesian government has recognized the importance of this transformation and has implemented several strategic policies to support it. One of the key opportunities emerging from this policy change is the development of robust and equitable infrastructure. Reliable digital infrastructure is a crucial foundation for the development of the digital economy. The government has launched programs such as the "Digital Indonesia Roadmap," which aims to strengthen internet networks across all regions, including remote villages. With adequate infrastructure, access to digital technology will be more equitable, thus encouraging digital inclusion and economic growth.

Furthermore, improving human resource (HR) skills is also a key focus in facing the era of digital globalization. The Indonesian government has invested in education and training programs focused on improving practical skills in information and communication technology. These efforts include improving digital literacy and developing STEM (Science, Technology, Engineering, and Mathematics) education programs. With skilled human resources, Indonesia can compete globally in the technology and innovation industry. Furthermore, the challenges faced in this transformation process cannot be ignored.

The digital infrastructure gap between urban and rural areas remains a major issue. Therefore, more effective policies and greater investment are needed to address this gap. Furthermore, improved regulation and governance are also

needed to ensure that digital technology developments go hand in hand with consumer protection and data security. To optimize this transformational opportunity, the Indonesian government has also introduced the concept of Industry 4.0 through the "Making Indonesia 4.0" program. This program encourages the adoption of advanced technologies such as robotics, artificial intelligence (AI), and the internet of things (IoT) in the industrial sector. Through this technological innovation, productivity and efficiency can be increased, ultimately enhancing the competitiveness of national industries in the global market (Syaharuddin Idris, 2024).

METHOD

This research uses a literature review approach to analyze the influence, dynamics, challenges, and opportunities in industrial relations in the digital era. This method was chosen because it aims to systematically identify and review research developments from previous research results, thereby providing a comprehensive overview of the topic under study. This approach allows for a structured and in-depth compilation of information from a variety of relevant literature. 1. This research uses data sources derived from scientific articles published in reputable national and international journals, academic books, and research reports related to industrial relations. These sources were accessed through databases such as Scopus and Google Scholar. 2. To ensure relevant literature, the inclusion criteria applied to this article include articles published within the last 5 years, with particular emphasis on recent research and articles discussing the topics of industrial relations, employment impacts, industrial relations dynamics, industrial relations challenges, and industrial relations opportunities in the digital era. 3. To find a library insight approach, the search is carried out by looking at and adopting keywords: "digital era industrial relations," "dynamics," "challenges," "opportunities," "revolution 4.0," and "influence of 4.0." The results of the literature review were then sorted according to the discussion criteria. 4. Validity The study was conducted to ensure the accuracy and results of the research by comparing the findings obtained with literature from various sources, checking the suitability of the findings between studies, and linking them to the context of industrial relations in the digital era by looking at the dynamics, challenges and opportunities.

RESULTS AND DISCUSSION

Literature results show that entering 2025, industrial relations in Indonesia will experience significant dynamics as a result of technological developments, regulatory changes, and labor market transformation. In this modern era, relations between workers, employers, and the government are no longer conventional and hierarchical, but rather are moving towards flexible, digital, and adaptive work models to global change. This transformation forces all industrial relations actors to adapt to the new paradigm. One of the main characteristics of the development of modern industrial relations is the emergence of non-traditional forms of work, such as digital platform-based work (gig economy), remote working , and short-term contracts. This is reflected in the rapid growth of the digital services and logistics sectors, which employ millions of workers, such as online motorcycle taxi drivers and e-commerce couriers. Unfortunately, many of them lack adequate industrial

relations protections, including social security, written employment contracts, and union membership. They work without clear protections, a minimum wage, and the right to collective labor. This situation poses a major challenge to creating fair and sustainable industrial relations in the modern era.

The government is attempting to address this gap by launching a program to digitize employment services and expand Social Security coverage. From a regulatory perspective, the enactment of the Job Creation Law (Law No. 6 of 2023) has had a significant impact on industrial relations. Although intended to create a conducive investment climate, several of its provisions have sparked controversy among workers, perceived as reducing employment protections. However, the government is attempting to balance this by opening up space for dialogue through revisions to implementing regulations and improvements to Tripartite Cooperation Institutions in various regions. Another positive development is the growing corporate awareness of Environmental, Social, and Governance (ESG) principles, including employment aspects. Many national and multinational companies have begun implementing fair employment policies, hybrid work systems, and improving worker welfare as part of their sustainability strategies. However, this implementation remains concentrated in large corporations, while MSMEs continue to face cost and human resource constraints. One significant phenomenon is the shift in power relations within the workplace. Modern unions now face the challenges of digitalization and industrial fragmentation, which make labor organizing more difficult. Meanwhile, young workers, including millennials and Gen Z, tend to be less interested in conventional forms of struggle and prefer advocacy based on social media or digital communities. This requires unions to transform culturally and strategically.

The reality on the ground also demonstrates inequality in access to industrial justice. The Industrial Relations Court (PHI) remains slow and unevenly distributed. Many workers in the regions have to travel long distances to resolve disputes, ultimately leading them to give up. To address this, the government has begun developing digital mediation services, although their eligibility is still under evaluation. In today's modern era, the government is also promoting digitalization in the employment sector, for example through the SIAPKERJA platform, the National Employment Information System (Sisnaker), and M-Pajak to ensure employers' compliance with employment regulations. However, differences in digital literacy levels between the central and regional governments remain a barrier to comprehensive implementation. Many micro-businesses and workers in the regions do not fully understand their industrial relations rights. In 2025, industrial relations will also be filled with contemporary issues such as mental health in the workplace, flexible working hours, and the recognition of workers who work based on algorithms. These challenges give rise to new discussions in modern industrial relations that focus not only on wages and termination of employment, but also on comprehensive welfare, humane treatment, and appreciation for the value of profitable work. Furthermore, the development of industrial relations in the modern era demands cooperation between the government, employers, workers, and civil society to create a fair, inclusive, and sustainable employment system. Strengthening social dialogue, enhancing the capabilities of labor unions, and technology-based policy innovation are key factors in ensuring industrial relations

in Indonesia's industrial sector remains able to keep pace with global transformation.

CONCLUSIONS

1. Technological developments have brought about major changes in production, distribution, and the labor market, particularly in the era of the fourth industrial revolution, which is progressing faster than ever before. Technology is not simply replacing many jobs; it can also create new markets, increase productivity, and drive industrial growth. While it poses challenges such as inequality and the need for new skills, technology still holds great potential to transform the way work is done, strengthen human resources, and drive more efficient and innovative economic development.
2. National industrial policy focuses on regulations, incentives, and the development of specific sectors to create market stability, create jobs, and reduce dependence on imports. However, this policy has the disadvantage of relying on traditional industries that struggle to adapt to digital technology, thus hampering the country's ability to compete in the increasingly evolving, technology-driven global market.
3. Companies face significant challenges in industrial relations due to rapid technological change and dynamic market demands, such as a shortage of qualified labor and an unattractive industrial image. Transforming industrial policy in the digital era requires adapting to new technologies, developing digital workforce skills, improving digital infrastructure and logistics, and implementing flexible and responsive regulations to support innovation while safeguarding public safety and interests.
4. Indonesia is undergoing an industrial policy transformation toward the digital era, with a focus on equitable digital infrastructure development and human resource capacity and expertise enhancement through various education and training programs. Despite challenges such as the digital divide and the need for better regulation, programs like "Making Indonesia 4.0" are encouraging the adoption of advanced technologies to improve work efficiency and competitiveness in the global marketplace..

IMPLICATIONS AND LIMITATIONS

This study provides several implications and acknowledges certain limitations related to the analysis of industrial relations in the digital era. Theoretically, it contributes to expanding the academic understanding of how digital transformation reshapes the interaction between workers, employers, and the government, especially in developing countries like Indonesia. Practically, the study highlights the importance of policy innovation that harmonizes technological advancement with fair labor practices. Governments are encouraged to design adaptive regulatory frameworks that support digitalization while ensuring worker protection in both traditional and platform-based employment. For companies, the findings imply the necessity to invest in digital skills development, human resource innovation, and the integration of artificial intelligence (AI) and data-driven systems

to maintain competitiveness and sustainability. Educational and training institutions are also advised to strengthen digital literacy and STEM-oriented curricula to prepare the workforce for Industry 4.0 challenges.

However, this study has several limitations. Since it adopts a literature review approach, the analysis relies on secondary data sources that may not fully reflect recent empirical realities. The absence of primary data such as field surveys or interviews with policymakers, employers, or employees limits the depth of understanding regarding the practical implementation of industrial relations in various sectors. Furthermore, the research focuses primarily on the Indonesian context, thus its findings may not be entirely generalizable to other countries with different economic structures, legal systems, or digital infrastructures. Future studies are encouraged to apply mixed-method or comparative approaches to validate these findings and to explore deeper insights into how digitalization continuously transforms industrial relations on a global scale.

REFERENCES

- (1) Awaliyah, C., Oktaviana, D., & Herlambang, Y. T. (2024). Challenges and opportunities of technology in the dynamics of life in the technological era. *UPGRADE: Journal of Information Technology Education*, 1(2), 91–96. <https://doi.org/10.30812/upgrade.v1i2.3729>
- (2) Fallah, D. N., Febriyanti, A. D., Julia, J., & Ramadhan, M. R. (2025). Challenges and strategies for implementing industrial relations in increasing the competitiveness of the manufacturing industry. *Agility: Lentera Manajemen Sumber Daya Manusia*, 3(2), 63–71. <https://jurnal.lenteranusa.id/index.php/agility/article/download/791/548/3717>
- (3) Hanafi, F. (2024). Gig boomonomy and industrial relations regulatory framework. *Journal of Social Sciences & Employment*, 5(2), 22–33.
- (4) Handayani, D. N., & Situmorang, S. L. (2025). Industrial management relations: A literature review of work dynamics and policies at Gojek. *COSMOS: Journal of Education, Economics and Technology*, 2(4), 802–808. Retrieved from <https://cosmos.iaisambas.ac.id/index.php/cms/article/view/301>
- (5) Hidayat, S., & Najicha, F. U. (2023). Industrial transformation towards digitalization and its impact on employment and the dynamics of employment relations in Indonesia (pp. 1–10). Retrieved from <https://www.researchgate.net/publication/375829136>
- (6) Hutahaean, R. M., & Utama, A. N. (2024). Analysis of the impact of the 4.0 revolution on corporate regulation: Challenges and opportunities in the legal and business sectors. *Management Balance, Economics*, 8, 1–15.
- (7) Khan, Z., Pratama, R. A., & Surahman. (2025). Opportunities and challenges in the industrial relations dispute resolution process at the East Kalimantan Industrial Relations Court. *Judge: Journal of Law*, 6(1), 53–70. <https://doi.org/10.54209/judge.v6i01.1083>
- (8) Kongidah, L., Al-Qarni, R. Q., & Aprianto, N. E. K. (2024). Transformation of national industrial policy towards the era of digital globalization. *Musyitari: Journal of Management, Accounting, and Economics*, 11(4), 21–30. <https://doi.org/10.8734/musyitari.v11i4.7928>

- (9) Syaharuddin, I. (2024). Opportunities and challenges for the West Java provincial government in encouraging the Industrial Revolution 4.0 in the industrial sector. *CR Journal*, 6(2), 73–88.