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Labor Law Does Not Exist in a Vacuum in the Era of Industrial Revolution 4.0



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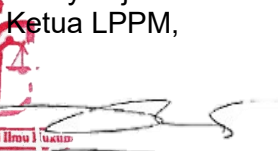
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Abstract

This study aims to present an overview of the implications of automation and digitalization, on the employment sector and its relation to labor law in the era of the industrial revolution 4.0. This research method uses normative juridical, legal research methods on secondary data using literature studies. The results of the study show that the industrial revolution 4.0 gave rise to the contemporary issues on employment, legal protection for workers, and the role of labor law. However, labor law is not in a vacuum in the era of the industrial revolution 4.0. This scientific contribution concludes that labor law as an employment law is expected to be adaptive to the development of advanced technology which has implications for job transformation, job profiles, and changes in the form of work. Therefore, this study is of interest to the government and the legislature and other stakeholders in order to interpret and respond to the impact of the 4.0 industrial revolution, the influence of information and communication technology on government policies, laws, and regulations. This must be done through review, harmonization and strengthening of labor law in order to provide legal protection for workers/laborers and increase the role of national labor law based on the philosophy of Pancasila as the nation's view of life and the 1945 Constitution as the constitution of the Unitary State of the Republic of Indonesia.

Keywords

Employment Sector, Labor Law, The Era 4.0 of Industrial Revolution, Pancasila, The 1945 Constitution, The Unitary State of the Republic of Indonesia

1. Introduction

Today, the industrial world has changed along with the acceleration of the de-

velopment of information and communication technology (ICT) in the era of the industrial revolution 4.0 (4th IR) which has an important role (Johnson, 2022), and has implications for real human progress civilization (Kaasinen et al., 2020; Rojko, 2017). The era of the industrial revolution 4.0 describes the vision of a future production system where revolution is inevitable and radical changes include various innovative technologies, and their application will have an impact on the transformation of the work environment (Abdelmajied, 2022). In the era of the industrial revolution 4.0, the focus has shifted from increasing production to increasing productivity in manufacturing, and leading manufacturers are now realizing the significant value of data and analytics, artificial intelligence, and machine learning (Gregolinska et al., 2022).

Sima et al. (2020) stated that automation to achieve connectivity through the use of cyber-physical systems in production processes related to design, processes, operations, and services (Abdelmajied, 2022) keeps people and industry connected (Johnson, 2022). Automation and digitization, causing significant effects such as transformation of jobs and job profiles, changing forms of work, and a more significant role for the platform economy, pose challenges for social policy (Sima et al., 2020), and public policy (Mandl, 2021). The digital economy also has the potential to increase productivity, incomes and social welfare as well as create job opportunities in new markets and increase employment in some existing jobs (OECD, 2016).

On the other hand, digital technology enables the production of more goods and services with less labor, and leaves some workers at risk of unemployment or lower wages (OECD, 2013). Automation and digitization open up opportunities for employment, among others, by increasing labor market opportunities for highly qualified workers, and good working conditions for highly qualified workers (Mandl, 2021). According to Mandl (2021), the risks posed by automation and digitization to work are as follows:

- 1) Job loss for low-skilled regular workers,
- 2) Limited ability of workers and the education system to adapt to changing skills needs, and
- 3) Lack of manpower in the fields of science, technology, engineering, and mathematics (STEM), and in relation to workers with atypical multidisciplinary skills.

In this case, government and business need to work together to help people adapt to this new technology through retraining and changes such as upgrading STEM skills (Cameron, 2015). According to Cameron (2015), upgrading STEM skills will be important in supporting people to take up high-tech jobs that will emerge from AI and robotics, but soft skills will also be important in getting people to adapt and be employed throughout their working lives. Soft skills refer to a group of personal qualities, habits, attitudes and social graces that make a person a good employee and suitable to work with (Jungsun et al., 2011).

According to the Collins English Dictionary (2022), the term soft skills is defined as qualities that are for a particular form of work that are independent of

the knowledge acquired: including common sense, ability to ask, and a positive flexible attitude. Soft skills are very important to handle interpersonal relationships, for example: 1). to make the right decisions, 2). to communicate effectively; and 3). to have a good impression and impact to get professional development (Anju, 2009; Jungsun et al., 2011; Collins Dictionaries, 2022).

According to Anju (2009), Jungsun et al. (2011), Collins Dictionaries (2022), soft skills used in the workplace include: communication skills, body language, team skills, how to manage time, stress management strategies, changing focus (activities), leadership performance, critical thinking, helpfulness and courtesy, flexible and adaptable, maintaining eye contact, using common sense, intelligence quotient (IQ), positive work ethic and attitude, maintaining good manners, understanding about development world (what happens on the news?), willingness to accept instruction and responsibility, able to relate to coworkers in a close environment, and others.

According to Anju (2009), Jungsun et al. (2011), Collins Dictionaries (2022), soft skills used in the workplace include: communication skills, body language, team skills, how to manage time, stress management strategies, changing focus (shifting activities), leadership strategies, critical thinking, showing kindness and courtesy, being flexible and adaptable, maintaining eye contact, using common sense, intelligence quotient (IQ), positive work ethic and attitude, maintaining good personal appearance, understanding about the development of the world (what's happening on the news?), willingness to accept instructions and responsibilities, being able to relate to colleagues in a close environment, and others.

Furthermore, automation and digitization pose risks to employment which are important issues in the context of the basic subject matter of labor law or labor law. According to Black's Law Dictionary, 2nd Ed (N/D), the definition and meaning of labor law has two categories: collective and individual are as follows: 1). Collective labor law covers the relationship of trade unions, employers and employees; and 2). Individual labor law covers the rights of employees at work. Affirmed by government agencies, legal regulations collectively cover workers, their organizations, trade unions, and trade unions.

Labor laws are also known as labor laws. Jenks in Britanica (2022) states that the basic subject of labor law is related to:

- 1) Work;
- 2) Individual working relationship;
- 3) Wages and remuneration;
- 4) Working conditions;
- 5) Health, safety and welfare;
- 6) Social security;
- 7) Trade unions and industrial relations;
- 8) Administration of labor law; and
- 9) Special provisions for certain jobs or other groups.

Based on these various descriptions, it can be interpreted that labor law or labor law can be interpreted as legislation related to employment which includes

social protection, equal employment opportunities and international labor standards, regulating work relations, protecting and establishing rights and obligations. Employers and workers clearly, ensure that there is harmony in the workplace and beyond. These things are regulated by labor laws, and these laws are enforced by government agencies (Kwach, 2018) in various countries in the world in general, and Indonesia is no exception. Labor laws are urgently needed to be used as a legal umbrella for the implementation of the employment system (Pardede, 2022), especially in the digital-based economy era.

Thus, labor law does not exist in a vacuum in the era of the industrial revolution 4.0. This is due to the various problems that occur related to what and how the Indonesian government is prepared to deal with, and answer the following: 1). Overview of contemporary issues regarding employment in the era of the industrial revolution 4.0, 2). Legal protection for workers/laborers in the era of the industrial revolution 4.0, and 3). The role of labor law in the era of the industrial revolution 4.0. Therefore, this article is entitled: “Labor Law Is Not In A Vacuum in the Era of the Industrial Revolution 4.0”, and the formulation of the research problem is as follows:

1) What are the Contemporary Issues on Labor in the Era of the Industrial Revolution 4.0?

2) What and How is Legal Protection for Workers/Labourers in the Era of the Industrial Revolution 4.0?

3) What is the role of labor law in the Era of the industrial revolution 4.0?

The answers to the questions as in the formulation of the problems in this research are very important for the government and the legislature as well as other stakeholders, regulators, academics, workers, entrepreneurs and others. This will have implications for labor law policies so that they can be fully utilized. In this context, labor law does not exist in a vacuum in the era of the industrial revolution 4.0 as the title of this article suggests. This article sequentially discusses contemporary issues related to employment, legal protection for workers/laborers, and the role of labor law in the era of industrial revolution 4.0. Furthermore, this article ends with a conclusion, which can be described as in **Figure 1** below as follows.

2. Literature Review

The industrial revolution 4.0, which initially started with the first industrial revolution, used water and steam power to mechanize production; the second industrial revolution, using electricity to create mass production; and the third industrial revolution, using electronics and information technology to automate production (Schwab, 2016). According to Schwab (2016), now the world is in the era of the fourth industrial revolution, is building a third industrial revolution in the form of a digital revolution that has occurred since the middle of the last century, and is characterized by a combination of technologies that blur the boundaries between the physical, digital and biological fields (Davis, 2016).

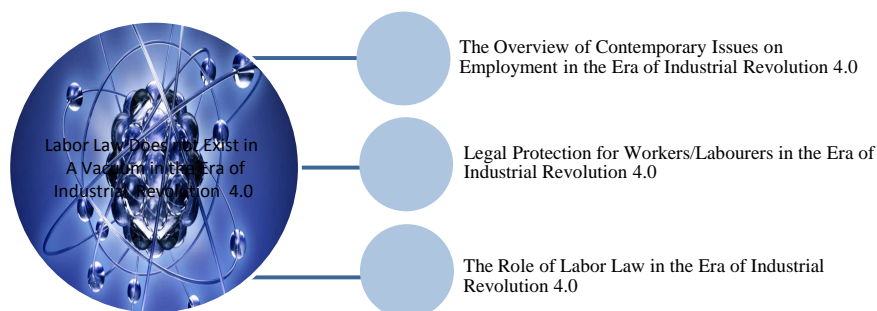


Figure 1. Labor law does not exist in vacuum in the era of industrial Revolution 4.0.

Fundamentally the industrial revolution 4.0 will change the way we live, work and relate to each other both in scale, scope and complexity, this transformation will be different from anything humans have experienced before (Schwab, 2016). According to Keywell (2017), billions of people and countless machines are connected to each other. The complexity of the technology that drives the industrial revolution 4.0, and the extent of its impact require all stakeholder groups to work together on innovative governance approaches (Davis, 2016).

Andrew Maynard of the Risk Innovation Lab in Davis (2016) states that we must learn from, apply, and expand prudent approaches to addressing the intersection of technology and society such as anticipatory governance and responsible innovation, supporting broad reflection on development, commercialization, and current spread, and developing technologies. Therefore, the world will always need human intelligence, human ingenuity, and human skills in the era of the industrial revolution 4.0 (Keywell, 2017). According to Keywell (2017), software and technology have the potential to empower people to a much greater degree than in the past—unlocking latent human creativity, perception, and imagination at every level in every organization.

The Industrial Revolution 4.0 changed almost every human activity: like how to make something; how to use planetary resources; how to communicate and interact with each other as human beings; how to learn; How to work; way of governing; and ways of doing business (Kaeser, 2018). Kaeser (2018) states that matters related to each of these human activities have unprecedented scope, speed, and reach. The industrial revolution 4.0 has several driving factors that can change life and work as it is known so far Shank (2016). According to Shank (2016), some of these driving factors greatly impact the technical, socio-economic, geopolitical, and demographic fields.

According to Shank (2016), some of these driving factors greatly impact the technical, socio-economic, geopolitical, and demographic fields. Furthermore, the magnitude of the impact of industrial revolution 4.0 on employment seems to be related to the skill level of workers, and on the other hand increasing the demand for computer-based jobs and creating new jobs related to computer development, operation and programming (Choi, 2017). Others are adding smart machines, networks, and digitization to this list, and what is important to remember is that these changes are additive, meaning they add to each other

(World Economic Forum, 2016).

According to Choi (2017), the impact of the technological revolution 4.0 is expected to be most affected by low-skilled jobs, and medium-skilled jobs, and high-skilled workers will be least affected (Zervoudi, 2020). This is a scenario that can lead to increased inequality (Choi, 2017). Furthermore, employees who are highly educated and highly specialized are less threatened by unemployment due to automation in contrast to low-skilled staff, whose tasks can be easily automated (Zervoudi, 2020).

According to Zervoudi (2020), the high percentage of people dropping out of education, employment or training further exacerbates the situation because the difficulty for less specialized workers to re-enter the labor market and adapt to new conditions will be great if they remain outside long periods of education, employment, or training. Therefore, business organizations that will be successful in the industrial revolution 4.0 era are those organizations that must be able to change their business processes. On the other hand, every business organization must be able to optimize investment in its people to be more likely to develop (Baldassari & Roux, 2017).

Baldassari and Roux (2017) state that significant skills are needed in analytics—in factories, customer service delivery, and employee management. It also requires strong links across software, hardware, and people. Thus, successful business organizations in the era of the industrial revolution 4.0 are expected to be adaptive in order to optimize the latest technological development systems, and be able to take advantage of the “intelligence” of their employees as an educated and skilled workforce and the need for legal protection for workers/labourers and the role of labor law.

Labor law is a set of regulations governing the legal relationship between workers or workers’ organizations and employers or employers’ organizations and the government, including the processes and decisions issued to realize this relationship (Aprilla et al., 2022). According to Liebman (N/D) that there is a point, labor law outlines minimum standards for protecting the interests of employees. This relates to: guaranteeing trade union rights at work; establishment of working relations; the rights and obligations of the parties in the relationship (with some aspects of the employer’s power as employer being specifically limited); the rights of women workers); lawful termination of employment, both in terms of individual dismissals and staff reductions; work safety; social security and pension benefits and so on.

Furthermore, labor law acts as a mediator between government, organizations and employers, workers and trade unions (Eastern Kentucky University, 2020) and applies to businesses, job seekers, and others (The U.S. Department of Labor, 2022). According to Eastern Kentucky University (2020), governments, organizations and employers, workers and unions define employee rights and responsibilities in a variety of work settings and can mandate everything from workplace safety and health to workers’ compensation.

3. Methodology

This research method uses normative juridical, legal research methods on secondary data using library data (Soekanto & Mamudji, 1985: p. 34) which is carried out by examining or studying problems in terms of legal rules (Soejono & Abdurahman, 2003: p. 28). Normative juridical is an approach that refers to the applicable laws and regulations and is relevant to the legal issues that are the focus of research (ADCO Law, 2022). Meanwhile, the descriptive-analytic qualitative approach in this research is used to describe the relationship of a particular phenomenon, idea or phenomenon as well as the data or facts found during the research, and carried out objectively. This research document uses data from published scientific contributions to explore the problem in depth. Furthermore, data collection techniques are carried out by taking or looking for secondary data from the problems studied through literature studies which include books, journals, theses, articles and so on that have been published in general. Thus, data collection is taken from reference sources that are related to the problems to be studied. Therefore, the research phase is carried out by identifying the problem, and analyzing the data and facts found.

4. Discussion

4.1. The Overview of Contemporary Issues on Employment in the Era of Industrial Revolution 4.0

In the era of the industrial revolution 4.0, advanced technology marked by artificial intelligence, robotics, blockchain, and 3D printing can change social, economic, and political systems, and these changes are often in unexpected ways (Menon, 2019). Ener and Elevli (2017) in Kurt (2019) stated that the industrial revolution 4.0 is a revolution in which jobs that require unskilled labor are executed by robots and value-added skilled labor specializes in creating more productivity.

Technological advances have led to dramatic increases in industrial productivity since the beginning of the industrial revolution, which in turn will increase manufacturing productivity, shift the economy, promote industrial growth, and change the profile of the workforce (Rüßmann et al., 2015). The era of the industrial revolution 4.0 has significantly changed products and manufacturing systems related to design, processes, operations, and services (Bányai et al., 2022).

According to Amin (2018), the main characteristics of the Industrial Revolution 4.0 era can be understood from the perspective of digital horizontal and vertical integration in the Industry 4.0 ecosystem; which forms the distinctive end-to-end digitization of the manufacturing and production sectors. The main characteristics of the industrial revolution era 4.0 include: 1). vertical and horizontal value chain digitalization and integration, 2). digitization of product and service offerings, and 3). digital business model and customer access (Amin, 2018; UNAIR News, 2019; Firdaus, 2021; Jakfar, 2015). Vertical integration is

integration between units within the company's internal, while horizontal integration facilitates the exchange of data and information from external parties such as customers and suppliers (UNAIR News, 2019).

Through the 4.0 framework, technology support is able to facilitate the needs of all interested parties in terms of data transparency, ease of communication, to increasing port productivity (UNAIR News, 2019). While digitizing product and service offerings is a business strategy, marketing strategy that regulates all aspects ranging from finance, resources, to consumer services, and its main function is how to spread the company's products to consumers (Firdaus, 2021).

According to Jakfar (2015), digital business models and customer access are new business models that are increasingly diverse and adaptive by utilizing technology such as online payments, subscription models, and so on, enabling businesses to explore other opportunities in the digital world such as:

- 1) Brokerage/Marketplace, this business model essentially connects sellers and buyers in one place;
- 2) Advertising, this business model connects advertisers with media owners;
- 3) Infomediary, this business model connects consumers with specific and valuable information curation;
- 4) Infomediary, a business model that connects consumers with specific and valuable information curation;
- 5) Merchant, the model existed before the digital era, but the difference lies in the use of digital as a distribution and marketing channel. This business model benefits from the sale of the resulting product;
- 6) Manufacturer, a business model that utilizes the power of digital to make business processes more efficient and effective. This business model benefits from the sale of products made, and manufacturers can sell products directly to consumers or to their network of distributors;
- 7) Affiliate, a business model that offers products owned by other companies, with a profit in the form of a percentage of profit if there is a sale. This business model does not pay any commission if no sales or any conversions occur;
- 8) Community, a business model that relies on an active community and high engagement to run its business. The way companies can benefit from the community business model can be through subscription fees, advertising services, direct selling, or others;
- 9) Subscription, a business model that charges consumers a certain fee in exchange for using the services offered. The more users you have, the more income you get. Examples of companies running this business model are Netflix, Spotify, and others; and
- 10) Utility/On-demand, a business model that charges according to the service used. We see a lot of this business model being more effective with the many service offerings offered. Examples of companies that run this business model are Gojek and Grab.

The era of the industrial revolution 4.0 had a significant impact on low-skill and repetitive jobs, which are generally found in many high-wage countries such

as developing countries (Menon, 2019). On the other hand, Menon (2019) also stated that high-skilled jobs are also not immune to the impact of automation and digitalization-based economic platforms in this era of the industrial revolution 4.0. In the era of the industrial revolution 4.0, many jobs have been and will be transferred using several advanced tools and technologies, thus helping to re-define conventional industrial processes (Abdelmajied, 2022).

According to Vaidya et al. (2018), there are nine vital pillars in industry 4.0, including cloud computing, system integration, simulation, additive manufacturing, artificial intelligence (AI), cyber security, augmented reality or the integration of digital information with the user's environment in real time (Gillis, 2022), big data, and the internet of things (IoT). The industrial era 4.0 spurred centralized technology with internet networks to create added value for society and companies (Roblek et al., 2016). According to Abdelmajied (2022), increasing digital transformation and increasing interconnectivity will bring new challenges to society in general, and also to labor law.

Furthermore, digital technology has given rise to potential short-term job opportunities that constitute a new and growing segment of the labor market – often referred to as the gig economy (Lenzen, 2020). According to Lenzen (2020), the gig economy basically refers to the involvement of freelancers to work on short-term, general jobs in sectors such as media, advertising, construction, IT and delivery/transportation services.

Digitalization is rapidly affecting all aspects of life, including the way we interact, work, shop and receive services and how value is created and exchanged (UNCTAD, 2021). Therefore, changing patterns of working life are being accelerated by globalization and technological change and in particular, changing the nature of work and the skill composition of the workforce (OECD iLibrary, 2022). According to the OECD (2017), several challenges related to the pattern of working life due to advances in information and communication technology in the employment sector require the design and implementation of the following policies:

- 1) Prepare young people for the jobs of tomorrow by ensuring that they are equipped with the right types of skills to successfully navigate through an ever-changing, technology-rich work environment, and provide all workers with the opportunity to continuously maintain their skills, upgrade skills and/or re-skill during their tenure.

- 2) Design labor market institutions (e.g. minimum wages; job protection; occupational health and safety regulations) that encourage employers to seize opportunities offered by technological change and globalization, while ensuring that risks are not disproportionately borne by workers in the form of low wages, vulnerability, and poor working conditions.

- 3) Rethink the social security system to minimize the possibility of people slipping through the holes by a) adapting or adapting them to new forms of work; or b) separate them completely from people's status and employment his-

tory.

4) Strengthen the activation framework to reduce some of the unavoidable adjustment costs of moving towards a more globalized and technologically advanced economy by assisting displaced workers by rapidly changing skill needs into new jobs.

5) Promote new forms of social dialogue that allow tailored solutions to new challenges to emerge at the enterprise level while amplifying the voices of workers who are increasingly working independently and separated by distance, language and legal context.

According to Mandl (2021), digitization not only affects all work as a collection of tasks, and the composition of work but also changes the task profile as follows:

1) Some tasks in an existing job profile are lost (because they are automated or no longer needed in a digital workplace), some are changed (for example, manual/physical work processes are digitized) and new ones are created (such as data analysis created through technology deployment);

2) Changes in task profiles can range from marginal to substantial, changes may be seen as resulting in the emergence of new job profiles and the disappearance of previous ones;

3) In manufacturing, a high-skilled job profile is needed so that labor market opportunities should be anticipated for: a). Traditional engineering profiles, such as engineers and quality control staff; b). Newer profiles, such as industrial data scientist, big data statistician, and data security analyst; c). Workers with multidisciplinary skills, such as managers with advanced data analysis/statistical competencies; and d). Workers with advanced management capabilities and soft skills.

Cameron (2015) states that the contemporary issues of employment in the industrial revolution era 4.0 are related to automation and digitization that affect employment, the composition and profile of job assignments by industrial sector, and the effect will vary from time to time as shown in Table 1 as follows:

Furthermore, the estimated average effect of automation and digitalization on employment issues such as employment, composition and job assignment profiles by industry sector, (Health, All Sector, Financial Services and Transport), and their effects can be described in Figure 2 below:

Table 1. The effect of automation and digitization on employment, composition, and profile of job duties by industry sector.

WAVES	INDUSTRIAL SECTORS			
	Health	All Sectors	Financial Services	Transport
Wave 1 (to early 2020s)	3%	3%	8%	3%
Wave 2 (to late 2020s)	15%	18%	28%	28%
Wave 3 (to mid 2030s)	20%	28%	28%	50%

Source: Cameron (2015), PWC estimate based on OECD PIAAC data, median values for 29 countries (processed).

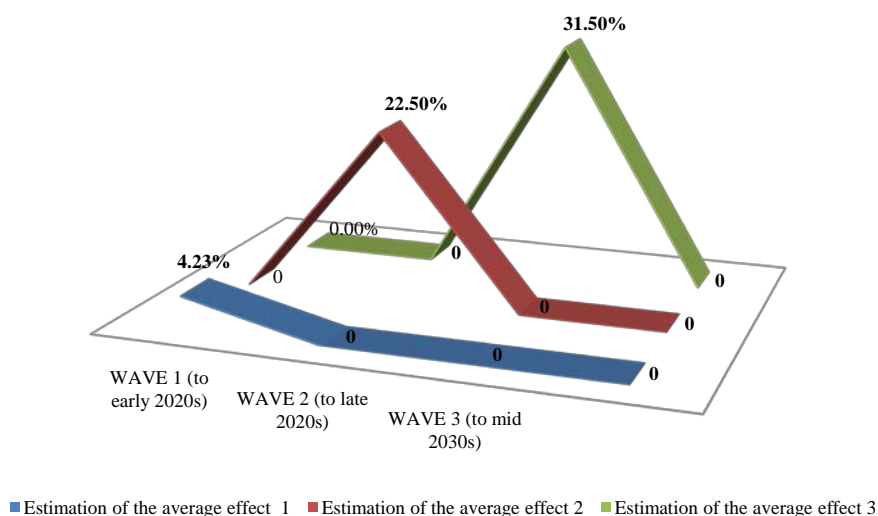


Figure 2. Graph of Estimation of the average effect of automation and digitalization on employment, composition and profile of job duties by industry sector and their effects (processed).

Referring to **Table 1** and **Figure 2** above, it can be interpreted that the effect of automation and digitization on work, composition and job task profile by industry sector, and their effects respectively are as follows:

1) Phase Wave 1 ((to early 2020s)—estimated average effect of automation and digitalization on employment, composition and job task profile by industry sector (Health, All Sector, Financial Services and Transport) and the effect is 4.25%. automation and digitization on employment, composition and profile of job duties by industry sector, and the effect on the Health, All Sectors, and Transport industry sectors are the same, at 3%, while the effect of automation and digitization on employment, composition and job profiles in the industrial sector Financial Services is 8%.

2) Wave phase (to late 2020s)—estimated average effect of automation and digitalization on employment, composition and job task profile by industry sector (Health, All Sector, Financial Services and Transport) and the effect is 22.25%. Data on the effect of automation and digitalization on employment in the industrial sector are as follows: the Health industry sector at 15%, the All Sector industry sector at 18%, the Financial Services industry sector at 28%, and the Transport industry sector at 28%.

3) Phase Wave 3 (to mid 2030s)—estimated average effect of automation and digitalization on employment, composition and job task profile by industry sector (Health, All Sector, Financial Services and Transport) and the effect tends to increase, by 31.5%. Data on the effect of automation and digitalization on employment in industrial sectors such as the Health industry sector is 20%, the All Sector industrial sector is 28%, the Financial Services industry sector is 28%, and the Transport industry sector is 50%.

In a critical study related to the estimation of the average effect of automation and digitalization on employment, the composition and profile of job assign-

ments by industry sector (Health, All Sector, Financial Services and Transport) and the effect is relatively small, the average is 31.5%. That is, there are 68.5% more industrial sectors that have not been affected by the acceleration of the development of information and communication technology in the era of the industrial revolution 4.0, the Wave 3 phase (to mid 2030s). In other words, at this time there is no industrial sector that is not affected by the acceleration of the development of information and communication technology in the era of the industrial revolution 4.0.

Furthermore, automation and digitization pose risks to employment, due to disruptive technologies. Disruptive technologies—predictive analytics, artificial intelligence, additive printing, the Internet of Things, nanotechnology, automation, and robotics—are not only better, they are combined. Reducing costs and increasing accessibility promise future prosperity and the creation of new jobs (Chang & Huynh, 2016).

According to Chang and Huynh (2016), simultaneously, automation and digitization are challenging existing workplace configurations, forcing dramatic changes at an alarming pace. This is what is becoming and important in the context of the subject matter of labor law, the labor market, employment relations and individual workers (Andreeva & Yolova, 2019). In this context, the government and the legislature as policy makers in the labor sector are expected to be able to determine the subject matter of persuasive labor law, namely describing legal sources—primary or secondary—that have authority (Legal Information Institute, N/D).

Therefore, the subject matter of labor law in the era of the industrial revolution 4.0 is expected to proactively respond and adapt, as well as consider policy harmonization (Andreeva & Yolova, 2019) with fast-paced technology, partiality to workers/labor, and job seekers. In the era of the industrial revolution 4.0, many industries may not be ready to face the consequences (Chang & Huynh, 2016).

Based on the various descriptions above, it can be interpreted that there is an influence of automation and digitalization on work, composition and job profiles according to industry sector (Health, All Sector, Financial Services and Transport) and their effects. **Table 1** and **Figure 2** provide information that the industrial revolution era 4.0 has significant implications for employment in the context of employment. This is the premise of this research that labor law does not exist in a vacuum in the industrial era 4.0. Therefore, legal protection for workers/laborers and the role of labor law in the era of the industrial revolution 4.0 related to the definition and meaning of labor law and the basic subject of labor law is vital.

Thus, the policy that can be taken by the government in the industrial era 4.0 is to seek to improve the quality of the workforce (Ilyas et al., 2020) through re-training and career changes (Cameron, 2015) as well as job qualifications, worker identity and worker-employer relations, which is the domain of labor law.

Therefore, labor law as an employment law is expected to be adaptive, able to adapt to the acceleration of the development of advanced technology, especially related to legal protection for workers/laborers, and the role of labor law in the era of the industrial revolution 4.0.

4.2. Legal Protection for Workers/Labourers in the Era of Industrial Revolution 4.0

Merkel (2014) states that the industrial revolution 4.0 is a comprehensive transformation of all aspects of production in industry through the merging of digital technology and the internet with conventional industry. In this case, Schlechtendahl et al. (2015) stated that in the era of the industrial revolution 4.0 the definition of the element of speed of information availability, namely an industrial environment where all entities are always connected and can share information with each other. Schwab (2016) states that industrial revolution 4.0 appears to create fewer jobs in new industries than previous revolutions. However, the industrial revolution 4.0 will change the way we live and the way we work, the way the economy works and how we are governed (Menon, 2019).

The industrial revolution 4.0 tends to affect both job qualifications, worker identity and worker-employer relations (Kurt, 2019) and it is expected to comply with the basic subject of labor law. According to Azzam (2019), labor law includes the obligations and rights of employers and employees, also regulates the employer's right to fire his employees, working conditions, and others and include non-discrimination clauses to form a national council to discuss national wage and minimum wage policies.

Lenzen (2020) states that technological advances have revolutionized the way people view today's work and present significant potential risks and legal challenges that need to be addressed. According to Cukier (2018), rapid developments in information technology are changing the way people work, consume, and interact so that government policies will influence the direction of technological development, and laws and regulations certainly need to be changed to respond to this new reality.

Referring to Figure 3, Cukier (2018) states that there are basically two schools of thought about what impact technology will have on mankind in the future. A pessimistic view of technology, fear that developments in AI, Big Data, IoT, and other areas will somehow replace human interaction and decision-making and, ultimately, rob us of what it means to be human. On the other hand, the optimistic view states that technology will have an impact on progress and will benefit mankind to help humans to solve many problems faced today and in the future.

In line with the views of optimists, labor law is expected to be able to adapt to developments in information and communication technology (ICT). According to Lenzen (2020), legal protection for workers/laborers is very much needed as described in Figure 3. For example, in Indonesia, legal protection for workers is

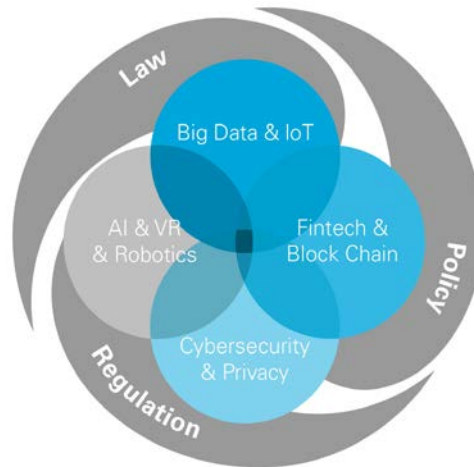


Figure 3. The influence of information and communication technology on government policies, laws and regulations (Cukier, 2018).

aimed at fulfilling the basic rights inherent and protected by the constitution. This is regulated in Article 27 paragraph (2) of the 1945 Constitution of the Republic of Indonesia (UUD, 1945). According to Article 27 paragraph (2) of the 1945 Constitution that every Indonesian citizen has the right to work and a decent living for humanity.

Furthermore, Article 27 paragraph (2) of the 1945 Constitution regulates legal protection for workers/laborers. The legal protection for workers/labor is meant to guarantee the rights of workers and guarantee equal opportunities and treatment without discrimination in any case to realize the welfare of workers and their families while still taking into account the progress of the business world and the interests of entrepreneurs. Therefore, the position of labor law in the era of the industrial revolution 4.0 is very vital and has a strategic meaning in order to provide legal protection in the employment sector, especially for workers/laborers in various industrial sectors.

According to Azhar (2015), labor law is part of the applicable law, which basically regulates the relationship between workers and employers, between workers and workers, and between workers and authorities based on work/employment agreements for other people. Molenaar in Azhar (2015) stated that labor law was originally called labor law or *arbeidrechts* in Dutch. Then, labor law in its development as an employment law has the following elements: a series of written and unwritten regulations; regulate the occurrence of working relationships between workers and employers; there are people who work for and under other people, get wages as remuneration; and arrangements for the protection of workers/labourers which include issues of illness, menstruation, pregnancy, childbirth, the existence of worker/labor organizations and so on (Hamid & Hasbullah, 2021).

Magalla (2018) in Hamid et al. (2022) states that labor law provides specifications for rights, obligations and regulates and informs subjects about how work-

ers behave in accordance with the terms of the contract and how workers can enforce their rights. Labor Law focuses on the relationship between management and workforce in the private sector, particularly with regard to the National Labor Relations Act, as amended, and its interpretation and application (Ray et al., 2011).

In this context, the government's readiness to face and respond to the era of the industrial revolution 4.0 must start from adjusting clear regulations and evaluating labor laws to protect workers (Pardede, 2022). The best solution is that the government and the legislature are expected to be able to review and harmonize labor legislation that must be implemented immediately. Employment legislation and skills development strategies must adapt not only to the world of work created by the previous industrial revolution but also to the new world of work brought about by the industrial revolution 4.0 (Bezuidenhout, 2022).

According to Bezuidenhout (2022), workers should be protected legislatively in the form of new and/or adaptive jobs that are not compatible with the traditional employment sector. Unions must move away from traditional job-focused bargaining strategies and must adapt their strategies to new forms of work (Bezuidenhout, 2022). At present, the regulations related to legal protection for workers/laborers as well as legislation in the field of manpower that apply in Indonesia are Law Number 13 of 2003 concerning Manpower (*Undang-Undang Nomor 13 Tahun 2003 tentang Ketenagakerjaan* or UUK No. 13/2003), and Law Number 13 of 2003 concerning Manpower. Job Creation Number 11 of 2020 for the Employment Cluster (*Undang-Undang Cipta Kerja Nomor 11 Tahun 2020 klaster Ketenagakerjaan* or UUCK No. 11/2020).

The two labor laws and regulations that apply in Indonesia, UUK No.13/2003 and UUCK No.11/2020 are the legal umbrella for the implementation of the labor system in Indonesia (Hamid, 2021). According to Article 4 of UUK No.13/2003, it is stated that manpower development is aimed at:

- 1) Empower and utilize the workforce optimally.
- 2) Creating equal employment opportunities and providing manpower in accordance with national development needs.
- 3) Provide protection for workers in realizing welfare.
- 4) Improving the welfare of workers and their families.

In general, employment development refers to the steps taken by the organization to improve the skills of workers/laborers and motivate them to acquire new knowledge and tendencies. Nussbaum and Sen (1993) in Lansky et al. (2018) state that employment development can be carried out through planned activities and training to help employees as human beings develop. In this context, the planned employment development activities and training are expected to address the knowledge gap of workers/laborers between the current and future stages.

One of the goals of manpower development in Indonesia is regulated in Article 4 UUK No.13/2003 point 3 is legal protection for workers in realizing pros-

perity. Legal protection for workers is aimed at ensuring the continuity of a good employment relationship system, and is also likely to significantly affect productivity and growth performance (OECD, 2013). A good working relations system is a central issue to provide legal protection for workers/laborers in the context of labor law. Meanwhile, the characteristics of a good working relationship system are without any pressure from the strong to the weak (Kurniawan et al., 2021), and also to ensure that long-term economic development can be achieved (Ghai, 2008).

On the other hand, legal protection for workers/labourers is a statutory instrument for the attainment of rights and responsibilities for both workers and employers which are generally regulated by the government with reference to labor law by considering economic, social and institutional structures (Ghai, 2002). According to Kurniawan et al. (2021), legal protection for workers/labor is a universal rule of law concept which consists of two forms as follows:

1) Preventive legal protection, which basically means prevention. Preventive legal protection is very meaningful for government actions based on freedom of action because with preventive legal protection the government is encouraged to be careful in making decisions. Preventive forms of legal protection are contained in laws and regulations to prevent a violation and provide limitations in carrying out obligations.

2) Repressive Legal Protection, serves to resolve disputes arising from violations. This protection is the last protection in the form of sanctions for violations that have been committed.

Then, efforts to strengthen and improve legal protection for workers/laborers in the era of the industrial revolution 4.0, labor law must be able to adapt to new types of skills that may be needed (Bezuidenhout, 2022). This is closely related to the situation where workers/laborers do not only compete with fellow humans, but they have to compete with technology created by humans themselves in the era of the industrial revolution 4.0 (Pardede, 2022). Therefore, to overcome the problem of legal protection for workers/laborers that emerged in the era of the industrial revolution 4.0, Naka needs to develop a new concept of labor law that contains standard regulations that apply to companies in each country.

Furthermore, labor laws must be able to encourage skills upgrading efforts and ensure that current workers, and future workers (Bezuidenhout, 2022) in terms of employment levels must be continuously updated in order to be better prepared to respond to various job challenges in the industrial 4.0 era. Therefore, legal protection for workers/laborers in the era of the industrial revolution 4.0 is the domain of labor law. Labor law as an employment law at this time must be reviewed and the aim is that the labor law is more directed to emphasize the rules on training and skills development for workers/laborers. This is so that workers/laborers have the skills to work efficiently for this type of work in the era of the industrial revolution 4.0 (Bezuidenhout, 2022).

Legal protection for workers/laborers in the era of the industrial revolution 4.0

is very closely related to the development of advanced technological advances. The current labor law in Indonesia is governed by various laws and regulations as follows:

1) Law Number 13 of 2003 concerning Manpower (UU No.13/2003) which has been amended by Law Number 11 of 2020 concerning Job Creation (UUCK No.11/2021).

2) Then, the Government of the Republic of Indonesia has issued a government regulation to implement both Law No.13/2013 and UUCK No.11/2021, namely: Government Regulation Number 35 of 2021 dated 2 February 2021 concerning Fixed Time Work Contracts, Outsourcing, Working Time and Rest, as well as Termination of Employment; and Government Regulation no. 36 of 2021 dated February 2, 2021 concerning Salary.

3) Law Number 2 of 2004, dated January 14, 2004 concerning Settlement of Industrial Relations Disputes

4) Law Number. 21/2000, dated 4 August 2000 concerning Workers Union.

Referring to several laws and regulations currently in effect, some of these laws and regulations tend to not accommodate issues in the labor sector related to legal protection and the role of labor law for workers/laborers in the era of the industrial revolution 4.0. In this context, the role of labor law is to provide protection and legal certainty for workers/laborers from dehumanizing practices at work. That is, labor law provides legal protection from factors that want to injure human rights.

However, the challenges of legal protection for workers/laborers with the transformation of the industrial revolution 4.0 era as a permanent consequence of digitalization of manufacturing, including internet connectivity and cyber-physical system interactions, big data processing and analysis, artificial intelligence, robotics, the use of digital clouds, digital modeling, and simulation of manufacturing processes through virtual reality, as well as the creation of new business models (Andreeva & Yolova, 2019). Therefore, the industrial revolution 4.0 has an impact on changes in the type and pattern of work of the workforce. The industrial revolution 4.0 has shifted the working relationship, namely the relationship between workers and employers is no longer in the form of working relationships but partnerships.

According to experts in Taryono et al. (2019) stated that the relationship between workers and employers is no longer in the form of a working relationship but a partnership so that the pattern of working relationships that developed in the era of the industrial revolution 4.0 is a partnership that has an impact on wages. Furthermore, experts in Taryono et al. (2019) stated several challenges of legal protection for workers/laborers in the era of the industrial revolution 4.0 as follows:

1) Regarding partnership, the basis must be the balance of the parties, for example in the work agreement it must be made based on the principle of collective agreement, but the fact is that the employment agreement is made unilate-

rally by the employer so that workers are forced to sign it. In this context, the function of the state is to be present to neutralize this imbalance by making regulations that contain limits and sanctions for those who violate it.

2) Labor relations in the future will be more flexible and a worker can work for more than 1 (one) employer. This development also needs to be supported through several policies such as unemployment insurance, and skill development funds to improve and develop workers' skills. This is important to anticipate the disruption of the industrial revolution 4.0, it takes labor reforms that provide the best protection not only for workers but also for the community so that they can access employment opportunities.

By looking at the development of relations in the 4.0 Industrial revolution era, the protection of workers is not only on their work status, but also the protection of their ability to work (the best protection is skills protection). Therefore, the role of labor law is to promote the common good to encourage workers/laborers and employers to do the right thing. Then, labor law regulates related to legal protection and certainty if a dispute arises in the context of industrial relations.

Based on the various descriptions above, it can be interpreted that legal protection for workers/laborers in the era of the industrial revolution 4.0 is very important and strategic in order to play an optimal role. Labor law has a set of laws and regulations that systematically assist workers/laborers and employers to feel more comfortable working and running a business based on the principle of mutual need. Therefore, legal protection for workers/laborers in the era of the industrial revolution 4.0 is aimed at guaranteeing workers' rights and guaranteeing equal opportunities and treatment without discrimination in any way to realize the welfare of workers and their families while taking into account the development of the business world in a sustainable manner.

Thus, the government together with the legislature, namely the People's Legislative Assembly of the Republic of Indonesia (DPR RI) are expected to be able to review and harmonize labor laws so that labor laws can often comply with advances in information and communication technology that have an impact on the employment sector. This is because labor law does not exist in a vacuum in the Industrial Revolution 4.0 era.

4.3. The Role of Labor Law in the Era of Industrial Revolution 4.0

According to [Bezuidenhout \(2022\)](#), there were three industrial revolutions in the past that had an impact on the changing realities of work as follows: 1). The first industrial revolution, showed a change from hand production to mechanical production and the use of water and steam; 2). The second industrial revolution, including the introduction of electricity and assembly lines that resulted in mass production; and 3). The third industrial revolution, known as the digital revolution which introduced the internet and computerization. At this time, the world is entering the era of the industrial revolution 4.0 which is marked by an accelerated change in technology where the world situation moves quickly into a digi-

tal economy. The characteristics of the digital economy are marked by a process of change and development in the structure of society and the economic system (Bezuidenhout, 2022).

The digital economy has direct implications for the employment, employment and organizational sectors which are included in the context of the basic categories and subjects of labor law (Black's Law Dictionary, 2nd Ed., N/D; Jenks in Britanica, 2022). Due to the situation in the industrial revolution 4.0 era where individuals and society will continue to transform, the transformation to empower and protect workers must be reflected in future labor laws (Boone, 2015). In this context, the influence of globalization on labor laws in the era of the industrial revolution 4.0 is due to a change in paradigm, business and trade transactions.

Changes in paradigm, business and trade transactions affect the regulatory system and economic policies of a country, including in the field of employment. The formulation of a country's policy cannot only pay attention to the interests of its country but must also pay attention to the interests of other countries and nations. According to Andreeva and Yolova (2019), it is necessary to redefine the traditional concept of the employer, which is defined by labor law.

The need to create new mechanisms of cooperation between companies, both legally and practically, is increasing, with the aim of creating adequate employers' organizations that are able to respond to the dynamics of the digital society (Andreeva & Yolova, 2019). Therefore, there is a growing need for the government to relinquish its position as a centralized regulator of labor relations and the government can play a role in enhancing interactions between stakeholders – employers, workers and employees (Andreeva & Yolova, 2019). In this regard, the role of labor law must be designed to empower and protect workers, and to ensure that the employer-employee relationship is monitored so as to enable both parties to be held accountable for their actions (The GPS Team in Business, Global Compliance, 2021).

Magalla (2018) and Schregle (2022) in Hamid et al. (2022) state that the role of labor law as an employment law is to enable effective enforcement of employers' rights and workers' rights which include employment, remuneration, working conditions, unions, workers, and industrial relations, social security and disability insurance. According to experts in Hamid et al. (2022), the role of labor law as an employment law is very important related to the business obligations of entrepreneurs as employers or employers to employees to maintain the safety and protection of employees in the work environment, including:

- 1) Classification of Workers—This classification of workers includes: full-time workers, part-time workers, temporary workers, interns and seasonal workers
- 2) Child Protection—Protection of children from violence, exploitation, abuse, and neglect
- 3) Wage Protection—Ensuring the protection of workers' rights in the private sector, and increasing the entity's commitment to timely and full payment of

wages

4) Reasonable Hours and Compensation—Rules relating to employees being paid or receiving compensation for at least the hours they actually work

5) Discrimination Prevention—Prevent discrimination in the workplace

According to *The GPS Team in Business, Global Compliance (2021)*, labor law as employment law plays a role in helping to balance this power imbalance so that no employer can exploit their employees, and both parties can negotiate equally with each other about working conditions, and related to the following issues:

1) Adequate Income—In a world where everyone wants at least an adequate income, one must protect oneself. Understanding labor laws allows you to know what your minimum wage is as an employee. In addition, you learn the importance of timely and regular payments, especially in terms of wages. No employer is allowed to exploit their workers. Therefore, if you are forced to work overtime, you should be aware of your employer's obligation to pay appropriate compensation. In addition, employers are also usually required to pay more when employees are required to work on holidays, weekends, and evenings.

2) Working hours—Most labor laws emphasize the importance of reasonable working hours to ensure that every employee has a work-life balance. Workers are granted annual paid leave, along with a daily or weekly maximum working hour limit. This ensures employers don't take advantage of their workers by making them do unnecessary overtime. If workers are called upon to work on a national holiday, they are usually granted a compensatory day off on a different regular working day.

3) Protection—As an employee, your workplace may be responsible for certain aspects of your life. This includes family responsibilities, such as paternity leave, parental leave, and flexible time options. Your workplace must be willing to provide you with paid leave during periods of personal obligation so you can establish a work-life balance. In addition, one of the most important features of universally accepted labor laws is to ensure the protection of children. Children under the age of 14 are not allowed to work in most places. Strict rules and regulations are enforced to ensure that children only work a few hours a day, when necessary. This is important to avoid exploitation of children. Employment laws also ensure that employees are not forced to work in unsafe conditions. In the event of a health hazard, employers must immediately notify their employees. No information should be hidden. Employment laws ensure that workers are protected, and that no laws are violated. Otherwise, there may be serious consequences for the employer in terms of fines or imprisonment.

4) Discrimination—Labor laws ensure that workers can operate without discrimination in the workplace. They monitor the employer-employee relationship so that there is no discrimination on the basis of gender, race, ethnicity, religion or disability. Many companies do not pay female employees the same amount for the same work as their male employees. However, with labor laws in place,

employees can hold companies accountable and ensure that they are granted their rights.

Furthermore, [Ahmad \(2022\)](#) stated that the role of labor law as an employment law is very important because of the following:

1) Labor law acts as a tool to promote worker empowerment and worker protection. It governs individual and collective working relationships. Other relevant legislation includes Constitutional law, civil law, criminal law as well as supranational ILO Conventions.

2) Labor law plays a role in correcting the imbalance of power between workers and employers; to prevent employers from firing workers without good reason; to organize and maintain a process by which workers are recognized as “equal” partners in negotiations about their working conditions and others.

3) Labor laws play a role in preventing a race to the bottom by placing restrictions on contract partners’ freedom to conclude contracts on whatever terms they wish, and setting minimum standards for safety and pay.

4) Labor law plays a role in regulating the labor market: a country may choose to enact laws that set a maximum or minimum limit on wages or hours worked, either nationally or in a particular sector or industry.

Referring to the historical role of labor law as a labor law, if there is a violation by the entrepreneur, there will be consequences of legal action enforced by the government. It becomes very important for the business world to incorporate best practices to ensure the welfare of the company and its workers. Therefore, labor law as an employment law must ensure that employers or employers as employers can respect the expertise of workers/laborers and are given proper compensation in accordance with the philosophy of Pancasila and the constitution, Article 27 paragraph (2) of the 1945 Constitution.

Based on the various descriptions above, it can be interpreted that the role of labor law as an employment law is to ensure that business operations which are an integral part of running a business in the era of the industrial revolution 4.0 must follow and comply with the laws and regulations. Labor law as an employment law plays an important and vital role because workers/laborers are human beings who must be treated well, in the work environment and their rights must be protected.

Thus, the role of labor law as an employment law is to protect workers from exploitation by employers or management, assist workers/laborers to get fair wages, minimize labor conflicts and strikes, ensure safety and health and work safety for workers/laborers, promote quality of work life in industrial systems and so on. Therefore, the role of labor law as a labor law is expected to be enhanced and able to adapt, adopt or overhaul existing government regulations to correct the imbalance of power between employers and workers/labor ([Befort, 2002](#)). This can be done by reviewing existing laws and regulations to improve the knowledge, skills of workers/laborers and their experience through vocational education in accordance with the reality of the demands of an automation and

digitalization-based economic platform in the era of the industrial revolution 4.0.

5. Conclusion

Labor law does not exist in a vacuum in the era of the industrial revolution 4.0, so that the position and role of labor law in the era of the industrial revolution 4.0 is very vital. As an axiom that there is no industry on the face of this planet that does not use labor even though technological advances in the 4.0 industrial revolution era which have implications for the transformation of work tasks by industrial sector began to occur in the WAVE 1 phase (to early 2020s). This condition gave birth to an economic platform based on automation and digitalization so that the position and role of labor law as a labor law is expected to be able to answer the problems that are expected to arise.

It is hoped that the role of labor law can provide a basis for a global economic system, and be able to reflect the values of labor as human beings, related to the equality of all people. Therefore, labor law as a labor law must be able to create a mutually beneficial situation and provide legal protection for workers/labourers and also for entrepreneurs as employers/employers. It is hoped that legal protection for both parties can be accommodated by labor law so that the various existing laws and regulations should be harmonized by the Indonesian government with the legislature, the People's Representative Council of the Republic of Indonesia (*Dewan Perwakilan Rakyat Republik Indonesia* or DPR RI) in order to create a successful working relationship in industrial revolution era 4.0.

Thus, labor law as labor law in the era of the industrial revolution 4.0 is expected to improve harmonious industrial relations so as to minimize industrial disputes. This scientific contribution concludes that the government and the legislature are expected to strengthen the national labor law. This aims to provide optimal legal protection for workers/laborers in the era of the industrial revolution 4.0. In other words, national labor law can adapt to the accelerated development of advanced technology, especially automation and digitalization-based economic platforms which have implications for job transformation, job profiles, and changes in the form of work.

State of the Art

Labor law is proven to have provided the basis for a global economic system that reflects the values of labor as a human being. Therefore, labor law does not exist in a vacuum in the era of the industrial revolution 4.0, so the role of labor law is vital to provide legal protection for workers/laborers in the era of the industrial revolution 4.0.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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