



# The Effect of Industrial Revolution 4.0 on the Provincial Unemployment Rate in Indonesia

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## ABSTRACT

The fourth revolution era can impact increasing the efficiency of the manufacturing chain and product quality through its connectivity and digitalization. However, although it can accelerate economic growth, the industrial revolution has a negative impact on employment and affects conventional business. This study aims to provide of the effect of industrial revolution 4.0 on the provincial unemployment rate in Indonesia. The Wilcoxon test examined the provincial unemployment rate before and after the Making Indonesia 4.0 roadmap launching. It was used because the data was abnormal, so the non-parametric test was used. Based on the output of test statistics, the value of Asymp. Sig is obtained 0.818. Because the value is greater than 0.05, it can be concluded that  $H_a$  is rejected. It means that there is no difference between the province's open unemployment rate before and after the Implementation of Making Indonesia 4.0. This study concludes that there is no effect of the launch of Making Indonesia 4.0 on the provincial open unemployment rate in Indonesia during the observation period (2017 to 2020).

**Keywords:** *Industrial Revolution 4.0; Unemployment Rate; Province*

## 1. INTRODUCTION

The phrase "industry 4.0" was coined in Germany in 2011, referring to a digital revolution that involves numerous forms of technology ranging from 3D printing to robots and is thought to boost productivity. The purpose of Industry 4.0 is to develop an open and intelligent manufacturing platform for information application in industrial networks and commercial innovation [1]. One of the most significant jumps in business and the global economy is Industry 4.0.

Industry 4.0 leverages emerging technology and the fast development of machines and equipment to tackle global issues by improving industrial processes [2]. This has the effect of speeding up the process, boosting the efficiency of the production system, and lowering the number of difficulties, resulting in lower production costs [3,4]. The final product is of higher quality, more pleasant, and less expensive to use and maintain.

Artificial intelligence, supercomputers, nanotechnology, computer engineering, self-driving vehicles, and innovation characterize the fourth industrial revolution period. Change happens at an exponential rate, affecting the economy, business, government, and

politics. For developing nations, Industry 4.0 can aid in the simplification of the industrial supply chain, which is critical in dealing with rising labour costs.

The national industrial sector must significantly develop in order to meet the fourth industrial revolution age, particularly in terms of mastering technology, which is a critical factor of competitiveness. At least five major technologies, including the Internet of Things, Artificial Intelligence, Human-Machine Interface, robotic and sensor technology, and 3D Printing technology, are supporting the development of the industry 4.0 system. To compete, Indonesian manufacturing enterprises must be able to control these five components.

A disruptive technology is one of the negative consequences of Industry 4.0. The presence of this disruptive technology will cause huge changes and eventually lead to the demise of established enterprises. When examined in light of current indications of global deindustrialization, the function of Industry 4.0 remains debatable. This is due to the growing importance of the service industry. The combination of slowing predicted economic growth and the shrinking prominence of the industrial sector has cast doubt on Industry 4.0's potential. Furthermore, Industry 4.0 has a detrimental

influence on employment generation. Only Singapore is prepared to handle this new industrial age in the ASEAN region.

Indonesia is dedicated to developing a globally competitive industry by speeding the deployment of Industry 4.0. Making Indonesia 4.0, launched by the Ministry of Industry, is an integrated roadmap for implementing various initiatives in the industrial era 4.0. The implementation of Industry 4.0 aims to create more sustainable economic growth. However, industrial revolution 4.0 has a weakness because it can reduce creativity and the loss of human resources from production technology. The increasing unemployment rate that can occur in some areas is also a negative impact of the industrial revolution 4.0.

Based on the background described, the researcher intends to carry out a study entitled The Effect of the Industrial Revolution 4.0 on the Provincial Unemployment Rate in Indonesia.

## 2. METHOD

This research is a quantitative descriptive study, which explains the influence of the industrial revolution 4.0 on the provincial unemployment rate in Indonesia. The technique of collecting research data is through documentation of data related to the object of research obtained from the statistical headquarters and other literature related to this research variable.

Unemployment is a measure taken if a person does not have a job, but they made an active effort to find a job in the last four weeks. The unemployment rate is the number of jobless persons as a proportion of the labour force, which includes the unemployed as well as those who are employed or self-employed.

The data analysis method used the paired sample t-test (for normal data) or the Wilcoxon test (for abnormal data). Before carrying out a different test, the normality test of the data must be carried out first. If the data is normal, then parametric testing can be done. However, if the research data is not normal, then non-parametric testing is carried out.

A paired t-test (paired t-test) is a way of evaluating a hypothesis with data that is not independent (pairs). One of the most common aspects of paired data is that one participant (object) in the research is treated to two separate treatments. Despite utilizing the same person,

researchers got two types of sample data: data from the first treatment and data from the second treatment. This case's hypothesis may be expressed as follows:

$$H_0 = 1 - 2 = 0 \text{ or } 1 = 2$$

$$H_a = 1 - 2 \neq 0 \text{ or } 1 \neq 2$$

$H_a$  means that the actual difference between the two means is not zero.

## 3. RESULT AND DISCUSSION

Digitization, information technology, and communication technology are transforming the way businesses create and give services to their clients. Human resource development has led to novel approaches and solutions. Human capital is now not just creative, but also superhuman.

The basis of the 4.0 revolution is information and communication technology, which, coupled with artificial intelligence, has a significant impact on the socioeconomic environment, every individual's life, and worldwide interactions. Over the next few decades, industrial robots will progressively take over particular professions, affecting the majority of occupations. As a result, old employment in manufacturing, agriculture, and utilities will disappear, while new professions in health, education, and service delivery will develop. However, these bar positions will necessitate the acquisition of new skills, particularly digital ones. Today, the employees most concerned about job automation are those with a shaky formal education. The most popular strategy for closing skill gaps is continuous staff retraining.

The scope of this research focuses on the provincial open unemployment rate in Indonesia, focusing on the differences before and after the implementation of Making Indonesia 4.0. Research data was obtained from the Central Bureau of Statistics.

In testing the hypothesis, we use the second SPSS output. The results of hypothesis testing are presented in Table 1. According to the results of "Test Statistics," Asymp.Sig. (2-tailed) is valued 0.818. Because 0.818 is more than  $> 0.05$ , we may conclude that  $H_a$  is rejected. It is means that there is no difference between the provincial open unemployment rate before and after the implementation of Making Indonesia 4.0, so it can also be concluded that there is no/no effect of the launching of Making Indonesia 4.0 socialization on the provincial open unemployment rate in Indonesia.

**Table 1** Wilcoxon Signed Ranks Tests

Item	Post-Test – Pre-Test
Z	-0.230
Asymp. Sig. (2-tailed)	0.818

According to leading experts, the fourth industrial revolution will define the future through influencing

government and industry [5]. People have little control over technology or the diversions that have emerged as a

result of the fourth industrial revolution. However, we can forecast the opportunities that will arise as a result of the fourth industrial revolution: 1) lower barriers between inventors and markets, 2) a more active role for artificial intelligence (AI), 3) integration of various techniques and domains (fusion), 4) improvement of our quality of life (robotics), and 5) connected life (internet).

Moving to industry 4.0 is an advantage that can be obtained so that it can remain competitive in various types of industries. Modern machines and tools using advanced software and network sensors can be used to plan, predict, adjust and control business results, thereby achieving value chain optimization [6], resulting in more dynamic production flows [7]. However, there is a significant negative effect in the form of disruption in the job market [8]. In addition, the development of complex and integrated science and technology in accordance with stage 4.0 will not only change aspect of trade, culture and society, but will also affect aspects of human biology and ethics.

Artificial intelligence's increasing tendency implies a severe economic upheaval in the next years. Artificial systems that logically handle difficult issues threaten many sorts of occupations while also opening up new opportunities for economic progress. According to a McKinsey & Company research, current technology will automate 50% of all existing labour functions, allowing corporations to save billions of dollars while creating new sorts of jobs [9]. Driverless automobiles, for example, might replace taxi drivers and Uber, but autonomous trucks could drastically transform deliveries, requiring considerably less effort from truck drivers.

Diverse scientific and technological fields will be integrated via innovative technologies. The fundamental factors will coalesce in "a convergence of technology that blurs the distinctions between the physical, digital, and biological realms" [1]. The combination of these technologies is more than just a combo. Fusion is more than just a complimentary technology; it generates new markets and prospects for growth for all innovators. To build a product, it incorporates incremental advancements from several disciplines (typically separated before).

Although the findings of this study reveal that the introduction of Making Indonesia 4.0 has had no influence on the open unemployment rate in Indonesian provinces, there have been other major obstacles encountered. The industrial revolution has the potential to increase inequality, particularly through disrupting the labour market. The substitution of labour by machines in place of labour automation throughout the economy may worsen the gap between capital and labour returns. In the age of digital technology, the rarest and most precious resource is neither ordinary labour or ordinary capital. People who can generate fresh ideas and inventions, on the other hand. In the future, a person's talent will

represent a critical factor of production more than capital. People with ideas will be the scarcest resource.

#### 4. CONCLUSION

The fourth industrial revolution (Industry 4.0) era can increase the efficiency of the manufacturing chain and product quality through connectivity and digitization. However, despite being able to accelerate economic growth, the industrial revolution had a negative impact. Industrial digitization will have a negative impact on employment and affect conventional businesses.

The government must consider not making the use of the digital industrial system a burden since it cannot be used optimally. Many things must be prepared, including decision-makers' roles, governance, risk management of system implementation, public access to technology, and security elements of the established system. Furthermore, the government must prepare a data collection system with integrity, determine the total price/cost of ownership of the system, prepare a legal umbrella and mechanism for protecting personal data, set service level standards, develop an applicable and anticipatory strategic roadmap, and incorporate design thinking to ensure industrial sustainability.

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