

Challenges of the Indonesian Bureaucracy in the Industrial Revolution Era 4.0

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Abstract: *In industry 4.0, manufacturing technology has entered the trend of automation and data exchange, includes physical-cyber systems, internet of things, cloud computing, and cognitive computing. The significant challenges faced by the Indonesian government in confronting the industrial revolution 4.0, in terms of human resources, of the 133 million workforces in Indonesia, only about 12 to 13 percent have undergraduate education. This type of research is library research using a descriptive approach. This study uses literature as the object of analysis, namely journals, online news, and books, which then interpreted and provided understanding. Global competition in this era, such as the Indonesian government system, is part of the current industrial revolution 4.0, through the Ministry of Administrative Reform and Bureaucratic Reform, the Indonesian government has set 10 national priorities with the policy of "Making Indonesia 4.0". That the industrial revolution 4.0 strategies, which is more focused on developing human resources in the experience in Indonesia, has proven to be superior to development that focuses on per capita income growth. Therefore, in the face of the industrial revolution 4.0, Indonesia needs to develop strategies for fostering quality human resources to be able to master information technology and take advantage of opportunities in the industrial revolution era 4.0.*

Keyword: *Bureaucracy, Industrial Revolution Era 4.0, Reform, Indonesia*

I. INTRODUCTION

The industrial revolution is a significant change in the way humans process resources and produces goods. The first industrial revolution occurred in the 18th century with the invention of steam engines for the production of products. During this time, Britain used the steam engine as the first mechanical loom to increase the productivity of the textile industry. Work equipment initially relied on human and animal labor and then replaced with machines. Also, steam engines used in the field of transportation.

The second industrial revolution occurred in the 20th century, marked by the invention of electricity. Cars began to be mass-produced, a change from an agrarian society to an industrial society. The third industrial revolution started with the birth of computers and robots, advances in computer technology developed extraordinary after the Second World War was over; networks also began to replace many humans as operators and controllers of production lines.

The industrial revolution 4.0 is a trend in the industrial world, combining automation technology with cyber technology. The term industry 4.0 comes from a project in the German government's advanced technology strategy prioritizing factory computerization.

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In industry 4.0, manufacturing technology has entered the trend of automation and data exchange, includes physical-cyber systems, internet of things, cloud computing, and cognitive computing. This trend has changed many areas of human life, including the economy, the world of work, and even lifestyle. The industrial revolution 4.0 instills intelligent technology that connected with various fields of human life (Rahayu, 2019). The development of information technology is rapidly happening now that automation is happening in all areas, new techniques, and approaches that combine real, digital, and fundamental.

During this industrial revolution, there was a big leap in the industrial sector, information and communication technology was fully utilized, to be able to compete, Indonesia must be able to adopt Industry 4.0 and prepare the right strategy in all sectors (Satya, 2018). The significant challenges faced by the Indonesian government in meeting the industrial revolution 4.0, such as digital infrastructure is inadequate, and digital platforms are not yet optimal. Cellular technology, still adopting 4G and not ready with 5G. The average speed of optical fiber is still less than 10 Mbps; also, cloud infrastructure is still limited. The problem of unskilled labor, Indonesia has the 4th largest workforce in the world but is very short of talent; there is no innovation center, the government budget for research and development is still minimal. Policy issues are always overlapping, handled by several ministries such as the upstream oil and gas industry managed by the Ministry of Energy and Mineral Resources, but the middle and downstream sectors controlled by the Ministry of Industry (Pablo, 2018).

In terms of human resources, of the 133 million workforces in Indonesia, only about 12 to 13 percent have undergraduate education. Most of them only graduated from elementary school, junior high school, and senior high school. In Southeast Asia, the skills of the Indonesian workforce are at the bottom. This condition makes the government and industry work hard to improve the capabilities of the workforce (Latief, 2018). The impact of digital technology towards the industrial revolution 4.0 in the next five years, there will be 52.6 million jobs that will experience a shift or disappear from the face of the earth. The results of this study give the message that every self still wants to have a self-existence in global competition must prepare mentally and skills that have a competitive advantage from others. The primary way to make for the most natural ability is to have good behavior, improve self-competence, and have a literacy spirit. The preparation of self-preparation passed through the path of education and self-concept through the experience of working across generations / across disciplines (Suwardana, 2018).

From these data, see that the Indonesian government is facing a significant challenge from the impact of the industrial revolution 4.0.

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On the one hand, having a positive value for the productivity of work and the efficiency of the production process, on the other hand, the competitive world of work impacts available labor will become a serious social problem for the pillars of a country's political and economic stability.

II. RESEARCH METHOD

This type of research is library research using a descriptive approach. This study uses literature as the object of analysis, namely journals, online news, and books, which then interpreted and provided understanding. The technique used to obtain data is the technique of critical reading and recording. The data analysis method used is descriptive analysis. Based on the concept of descriptive data analysis, the information is obtained, collected, and processed using descriptive analysis.

III. RESULT AND DISCUSSION

Bureaucratic reform is a fundamental change in the system of governance from the institutional aspects, management, and human resources (Yusriadi, 2018a). Global competition in this era, such as the Indonesian government system, is part of the current industrial revolution 4.0. Indonesia is ranked 77th out of 119 countries in the Global Talent Competitiveness Index, with a value of 38.04. To improve the index, the government, through the Ministry of Administrative Reform and Bureaucratic Reform, implemented the Human Capital Management Strategy towards Smart Civil Apparatus in 2024 (Reform, 2019). Every State Civil Apparatus must adapt to information technology so that service performance is faster, more accurate, and efficient. The form of bureaucratic digitalization as a maximum service effort is mandatory. In 2020, Indonesia entered into the Grand Design of the State Civil Apparatus Development 2020-2024. The Indonesian government is trying to improve the performance of the civil service, starting from the recruitment stage by implementing a digital system. Hoped that with the recruitment system, it can reduce fraudulent recruitment, hoped that it could become a smart state civil apparatus to bring Indonesia's world-class bureaucracy. Bureaucratic reform is an effort to improve the system of government administration, especially institutional aspects, management, and human resources of the apparatus (Umar et al., 2019). Information technology applied in state institutions such as legislative, executive, and judiciary. Even public administration officials can use technology to convey information about the government to the public (Yusriadi, 2018b). The Indonesian government has set 10 national priorities with the policy of "Making Indonesia 4.0", firstly improving the flow of material flow by strengthening the production of upstream material. Second, redesigning the industrial zone by building a road map of the national industrial region. Third, sustainability standard accommodation. Fourth, empowering micro small and medium businesses. Fifth, create a national digital infrastructure with the development of digital networks and platforms. Sixth, attract foreign investment by targeting leading global manufacturing companies through attractive offers and incentives to accelerate technology transfer. Seventh, improvement in the quality of Human Resources such as redesigning the education curriculum to adapt the industry era 4.0 and talent

mobility programs for professionals. Eighth, the formation of an innovation ecosystem with the development of Research and Development and Design centers by government, private, public, and universities. Ninth, implementing technology investment incentives by introducing tax exemptions or subsidies for technology adoption and financial support. Tenth, harmonizing rules and policies by harmonizing policies and regulations across ministries (Dwi, 2019).

With the "Making Indonesia 4.0" program a positive thing in the face of a new era of the industrial revolution, one of the main items of the program is improving the quality of human resources. One of the processes in developing the capacity of the apparatus is education and training activities (Yusriadi, Sahid, Amirullah, Azis, & Rachman, 2019). The issue of human resources is a major limiting factor in the face of the industrial revolution 4.0. Indonesia as a developing country, with an area of 5,455,675 km² and 3,544,744 km², of which or 2/3 of its territory is an ocean. Based on World meters data, Indonesia currently has a population of 269 million people or 3.49 percent of the total world population. Indonesia ranked as the fourth most populous country in the world after China (1.42 billion people), India (1.37 billion people), and the United States (328 million people). As many as 56 percents or 150 million inhabitants of Indonesia are urban people. Indonesia's population continued to grow from 261.1 million in 2016 to 263.9 million in 2017. In 2018, Indonesia's population will reach 266.7 million. Seeing these conditions is a big challenge for the Indonesian government in improving the quality of its human resources.

Input standards are necessary because very high inter-regional variability can make public systems fail to meet output standards, especially when regional capacities are weak in providing funds, infrastructure, and human resources capable of supporting the fulfillment of service output standards (Yusriadi, 2018c). The competitiveness of Indonesia's human resources is still lagging when compared to other Southeast Asian countries. Indonesia's human resources are yet ranked 65 out of 130 countries with a score of 62.19. This figure is behind compared to Malaysia ranked 33, Thailand ranked 40, the Philippines ranked 50, and Vietnam ranked 64 (Brodjonegoro, 2019). The rapid economic development in Japan and Western Europe which experienced a total collapse during World War II was mainly due to these countries having adequate human resources, the miracle of Korea and the miracle of Taiwan were seen as human resource-based because resource development carried out earlier than event the economy (Gold, 1988).

Human resource development is now a priority for the development of the Government of Indonesia within the next five years. Various programs that support the improvement of the quality of education, both at the primary and secondary levels, are optimized to encourage the nation's competitiveness. Access to quality education in Indonesia is still centralized in Java. Meanwhile, according to the population, only about 8.5 percent or 15.5 million people from the total population of Indonesia are able to graduate from tertiary institutions.

As many as 26.3 percent had a high school education, and the remaining 65 percent went to junior high school (22.8 percent) and elementary school (42.4 percent). On the other hand, in the next few decades Indonesia has the potential to become the country with the largest economy in the world (Ghufron, 2019).

To prepare for the golden generation, education remains the main road. In this case, education for all becomes work that needs to be completed. Not just equalization, but also improving quality. These efforts include conducting the early childhood education movement and completing and improving the quality of basic education. In addition, the expansion of access to tertiary institutions is also prepared through the establishment of tertiary institutions in the border area and gives access specifically to people who have limited economic capacity, but who have academic ability. The world problems and national problems are increasingly complex, demanding to always learn so that they do not stutter about change. The population is increasing, the diversity of different cultures, internal and international conflicts require to keep learning. The fact shows that conventional education at present does not contribute to solving existing problems but instead widens the existing gap. Non-school education is an alternative education that can give a new color in the world of education.

IV. CONCLUSION

This paper begins with the assumption that the strategy of industrial revolution 4.0, which is more focused on developing human resources in the experience in Indonesia, has proven to be superior to development that focuses on the growth of per capita income. Therefore, in the face of the industrial revolution 4.0, Indonesia needs to develop strategies for fostering quality human resources to be able to master information technology and take advantage of opportunities in the industrial revolution era 4.0. For this reason, one of the main priorities in efforts to foster human resources is that efforts to improve the quality of education must be carried out as a step towards creating a golden generation as quality human resources. With that can improve the level of Indonesian human resources in the labor competition in the current 4.0 industrial revolution. In addition, it must also be more caring and critical of everything that happens to the world around.

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