

# PEMBANGUNAN INDUSTRI PERTAHANAN NASIONAL PADA ERA REVOLUSI INDUSTRI 4.0

Oleh:

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## Abstrak

Revolusi Industri 4.0 yang juga dikenal dengan istilah cyber physical system, merupakan suatu fenomena hasil dari kolaborasi antara teknologi siber dan otomatisasi. Dalam proses pengaplikasiannya, guna meningkatkan efektivitas dan efisiensi, sistem tersebut banyak mengurangi keterlibatan tenaga manusia, sehingga memiliki dampak yang signifikan terhadap dunia industri, tidak terkecuali industri pertahanan. Penelitian ini menggunakan metode kualitatif dan pendekatan studi literatur. Konsep dan teori yang digunakan dalam penelitian ini adalah teori pembangunan, dan konsep revolusi industri 4.0. Hasil dari penelitian ini adalah pembangunan industri pertahanan sangat berkaitan erat dengan perekonomian suatu negara, dimana perekonomian dapat memengaruhi tingkat kemutakhiran teknologi yang dimiliki baik oleh negara maupun masyarakatnya. Di Indonesia perkembangan teknologi masih cenderung tertinggal daripada beberapa negara tetangga, sehingga dapat dikatakan bahwa pembangunan industri pertahanan juga masih belum maksimal. Selain itu jika mengurangi peran manusia dalam sektor industri pertahanan, akan menghambat laju perekonomian nasional, mengingat masih banyaknya jumlah pengangguran di Indonesia.

**Kata Kunci:** Industri pertahanan Nasional, Pembangunan, Revolusi Industri 4.0

## 1. PRELIMINARY

The industrial revolution is a global change that affects many aspects of life. The first industrial revolution occurred in the 18th century, where the steam engine was invented. Since then, research has continued to be carried out according to the needs of each era until finally at this time, the world is entering the era of the industrial revolution 4.0 where science and technology are developing very rapidly. So that in the industrial revolution 4.0, cyber physical systems, the Internet of Things, and internet networks greatly affect everyday human life because they become one of the mandatory needs.

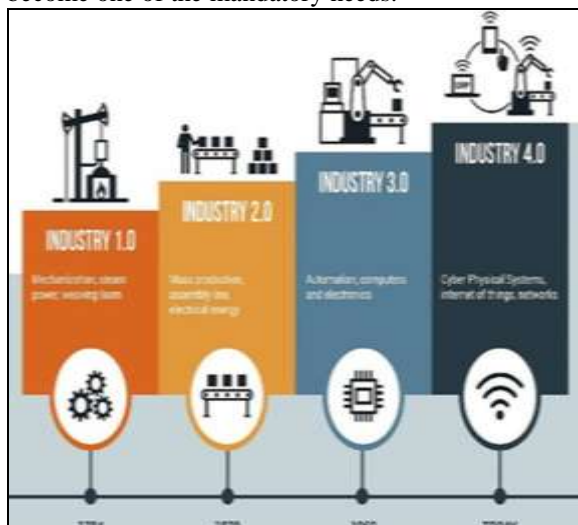


Figure 1 Industrial Revolution

Source: Siap-siap, Industri 4.0 Bikin Lenyap beberapa Jenis Pekerjaan (Natalia, 2021)

More clearly, the important point in the 4.0 industrial revolution is the emergence of many technological breakthroughs in various fields, such as:

- Robotics and artificial intelligence (Artificial Intelligence);
- Nanotechnology;
- Quantum Computing;
- Internet of Things;
- Industry Internet of Things;
- 5th generation (5G) wireless technology;
- Manufacturing Additives;
- Fully Autonomous Vehicle Industry (Ministry of Defense of the Republic of Indonesia, 2019).

From some of the breakthroughs above, it can be concluded that the industrial revolution 4.0 is the trigger for globalization. So that all aspects of life are gradually moving towards a global, borderless, and open direction. Both in terms of science, in terms of communication between humans, as well as in terms of cooperation between individuals and individuals, individuals with groups, and groups with groups. Hendra Tanumihardja, Executive Vice President of Human Capital Management at BCA, said that in the era of the industrial revolution 4.0, soft skills are needed that cannot be replaced by machines. Namely the ability to recognize oneself and the environment, as well as how to manage relationships with the social environment, or social intelligence (Susanti

and Djumena, 2019). Quality, competent and ethical human resources are valuable assets of the Indonesian nation in facing the era of the industrial revolution 4.0 which is characterized by artificial intelligence (AI) (Budiharto, 2019).

The industrial revolution 4.0 occurs in all aspects of life, whether individuals, families, communities, or the state, one of which includes the defense aspect. One aspect of defense that is strongly influenced by the industrial revolution 4.0, is the defense industry, namely the industry that produces and provides services related to Defense and Security Equipment Tools (Alpahankam), where the defense industry is one of the important aspects that must be considered in order to support national defense.

The current issue related to the development of the defense industry is the role of the state in the defense industry. One example of the problem, in the Ministry of Defense Regulation No. 24 of 2010, it has been determined that PT. PAL, PT. DI, PT. Pindad, PT. Dahana, PT. Len, PT. Core and PT. Krakatau Steel (KS) as a defense industry. However, in 2010, PT. Krakatau Steel sells its shares, which is regulated in PP No. 33 of 2005 article 9 which states that a company engaged in defense-related sectors cannot sell shares of a company that is a BUMN in the form of a limited liability company with at least 51% of the shares owned by the Republic of Indonesia, either partially or wholly to other parties, although it has the aim of increasing the company's performance and value, increasing the benefits for the country and society (Privatization).

Another issue related to the defense industry is Minimum Essential Forces (MEF), in which the National defense industry is required to fulfill the ownership of the latest technologically advanced Defense and Security Equipment (Alpahankam) by importing, but on the other hand it is also urged to build a defense industry in order to achieve independent defense industry, but not accompanied by adequate technology transfer, resulting in an imbalance between objectives and the competence of human resources and technology. In addition, the Chairman of the Central Initiative Governing Body, Al Araf said that the problem that occurred in the defense industry was the lack of government commitment, which led to a lack of government policy support considering that many imports were still being carried out, technology transfer was not carried out properly, and the slow development of the national defense industry (Sucahyo, 2021).

On the basis of the above background, research was carried out related to the development of the National defense industry in the era of the industrial revolution 4.0, in order to find out which efforts were made by the government in realizing the MEF in 2024, as well as the independence of the National defense industry in 2029.

## 2. RESEARCH METHODOLOGY

### Research Methods and Design

Research on the development of the national defense industry in the era of the industrial revolution 4.0 was carried out using qualitative methods. According to Creswell, research using qualitative methods can be identified directly by engaging in the activity of the object, or informant, as well as investigating using a narrative approach from a collection of stories of the individuals involved. Qualitative research is systematic. The data collected comes from interviews, observations and documentation from trusted informants, while secondary data is obtained from literature studies and existing documents to support primary data (Creswell, 2013: 225).

This study uses a descriptive analysis approach which is an analytical technique used in analyzing data by making a description of the collected data without making generalizations from the results of the study. Descriptive analysis in this study aims to collect actual information in detail that describes existing symptoms, identify problems or examine conditions and prevailing practices, make comparisons or evaluations and determine what other people do in dealing with the same problem and learn from experience. them to set plans and decisions in the future (Nurdin and Hartati, 2019).

## 3. DISCUSSION

### History of National Defense Industry

In 2005, the strategic industry underwent a name change to the defense industry under the pretext of revitalizing the performance of the national strategic industry. This step was taken with the aim of reducing the dependence of Alpaankam from abroad, both in the form of whole and spare parts. The next step is to strengthen Indonesia's goal to create an independent national defense industry.

For this reason, it is regulated in Presidential Regulation No. 42 of 2010 that an agency was formed under the name of the Defense Industry Policy Committee (KKIP), which was further strengthened by Law no. 16 of 2021 concerning the Defense Industry.

The formation of the KKIP is the initial stage in making improvements to the national defense industry. By reporting directly to the president, KKIP is assisted by 5 ministries, namely the Ministry of Defense, Ministry of SOEs, Ministry of Industry, Ministry of Research and Technology, and Ministry of Finance.

KKIP has the main task of compiling a master plan and blueprint for the domestic defense industry to achieve the TNI's Minimum Essential Forces (MEF) development in 2024 by utilizing PT DI, PT Pindad, and PT PAL as the three largest state-owned defense industries, as well as using APBN funding. . So that by 2029, it is hoped that the Indonesian defense industry can be aligned with the

world's defense industry. With the realization of the revival of the domestic defense industry, Indonesia is ready to compete with the international market.

Based on the principles of the industrial revolution 4.0, the criteria for the development of the defense industry can be assessed through 4 points, namely:

- 1) Interconnection in the 4.0 industrial revolution requires the National defense industry to have a connection with each other through the Internet of Things which is the hallmark of the 4.0 industrial revolution. If the defense industry is able to apply this principle, then technology transfer and training activities to improve the competence of human resources can run better. This will create competent human resources and increase the competitiveness of the national defense industry in the global arena. However, to implement this, we need a capable security system, which can protect all parties involved in the collaboration.
- 2) Transparency in the industrial revolution 4.0 requires the national defense industry to apply transparency to the results of research and development carried out. In addition, transparency related to funding is also one of the factors that can improve the national defense industry, which is a benchmark for financing, considering that so far the funds given to the Ministry of Defense, one of which is used for the development of the defense industry, has always been a polemic.
- 3) Technical assistance from the system to humans. Automating by improving technology in the national defense industry by involving sensor systems and artificial intelligence has begun to be used both in completing light work such as fingerprint scans, data analysis, as well as quite heavy ones such as implementing artificial intelligence systems on Alpahankam.
- 4) Decentralized decisions are usually closely related to decentralized decision making. So that the development of the national defense industry should not only be centered on the decisions of the central government, but also local governments, service users, and defense industry service providers who can collaborate with each other under the right rules.

Which of the four points above affect how the development of the National defense industry in achieving its goals, as follows:

- a. Encouraging the development of the defense industry structure and cooperation with foreign defense industries.

- 1) Interconnect

Collaboration is carried out in the form of technology transfer with developed countries, either by studying science or by collaborating in an Alpahankam development project with the targeted developed countries. Of course, today's collaboration

depends a lot on the Internet of Things. Indonesia's weakness is that it still has an incompetent information security system, thereby increasing the potential for data theft, and so on.

- 2) Transparency

The data analysis carried out can only be presented to certain agencies and is limited in nature considering the cooperation carried out is related to the internal military. Of course, this causes the availability of information to be limited, and only those with an interest can access the information.

- 3) The technical assistance that can be obtained in carrying out cooperation is the improvement of the current system, where technology transfer and training can be carried out for superior human resources related to the development of the National defense industry.

- 4) Indonesia still cannot implement decentralized decisions in carrying out cooperation with the foreign defense industry, where decisions on cooperation along with activities and all details still have to go through the Central Government, namely the Indonesian Ministry of Defense.

- b. Improving the technological capabilities and capabilities of the defense industry;

- 1) Interconnect

The collaboration carried out is between companies engaged in the national defense industry, both public companies and private companies. Cooperation is carried out both in determining the standards and safety of the Alpahankam produced.

- 2) Transparency

The data analysis carried out can only be presented to certain agencies and is limited in nature considering the cooperation carried out is related to the internal military. Of course, this causes the availability of information to be limited, and only those with an interest can access the information.

- 3) The technical assistance that can be obtained in carrying out cooperation is the improvement of the current system, where a technology transfer can be carried out independently by each company. Which if needed, the capabilities possessed can be used as technical assistance to national companies, and the development of the national defense industry.

- 4) Decentralized decisions can be made by each company involved depending on what kind of cooperation is being carried out, so that they are not bound by decisions from the Central Government or other institutions.

- c. Carry out integrated development of the defense industry through the K/L program within the scope of the Defense Industry Policy Committee (KKIP).

- 1) Interconnect

The collaborations carried out under KKIP by companies include PT. Pindad, PT. DI, and PT PAL to encourage the development of the defense industry

through the three largest Alfahankam companies in Indonesia.

2) Transparency

The results of analysis, research, and news are published on KKIP's website, namely <https://www.kkip.go.id/>, so that it can be accessed openly by the public using internet media.

3) Technical assistance that can be obtained by providing the Ministry of Technology and Information contributes to assisting KKIP's efforts in encouraging the National defense industry to achieve MEF in 2024, and helping Indonesia achieve independence of the National defense industry in 2029.

4) The decentralized decision was not made considering that KKIP is directly under the president with the assistance of 5 ministries, namely the Ministry of Defense as the leading sector, the Ministry of SOEs, the Ministry of Industry, the Ministry of Research and Technology, and the Ministry of Finance. Thus, the decisions taken are under KKIP.

### 3. CONCLUSIONS AND RECOMMENDATIONS

The development of the national defense industry is carried out by doing 3 things, namely: (1) encouraging the development of the defense industry structure and cooperation with foreign defense industries; (2) improve the technological capabilities and capabilities of the defense industry; and (3) conducting integrated development of the defense industry through the K/L program within the scope of the Defense Industry Policy Committee (KKIP). Of course, these three things must be adapted to the times, where the world has now entered the era of the industrial revolution 4.0, where all human activities are influenced by the existence of the Internet and big data.

Industry in the industrial revolution era 4.0 has 4 principles, namely interconnection, information transparency, technical assistance, and decentralized decisions. These four principles must be applied in running the industry in the era of the industrial revolution 4.0, so that industrial development carried out is not far behind by developed countries which always carry out technological updates.

By applying these four principles in the development of the national defense industry, it was found that collaboration with foreign countries still encounters obstacles, especially in technology transfer. In addition, not all data transparency can be implemented, considering the defense industry is related to military affairs which cannot be accessed arbitrarily by the public. As for technical assistance, what must be prioritized is the development of systems that can help make root work easier, especially artificial intelligence systems, so it can be said that the principle of technical assistance in the development of the Indonesian defense industry is

strongly influenced by the collaboration carried out. The last is decentralized decisions, where in the development of the National defense industry, most of the decisions are still in the hands of the Central Government, except when cooperation is carried out between private companies, where they still have a role in regulating the development of the company.

In addition, it is known that the KKIP does not include the Ministry of Technology and Information, even though in this era of the industrial revolution 4.0, the Ministry of Technology and Information has a fairly large role in responding to it.

Recommendations that can be given are, of course, in all respects, the success of a development is influenced by the resources it has, both human resources and natural resources. Likewise with the development of the National defense industry, the first thing that must be addressed is the competence of human resources. It is undeniable that, as a developing country, Indonesia still has to deal with other humanitarian issues, so the decision to achieve the MEF is deemed to be the right one. Even so, the industrial revolution continues, which has now entered the 4.0 era, so the activities carried out must also be able to adapt.

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