



## **ANALYSIS OF DEFENSE HUMAN RESOURCES COMPETENCY IN FACING THE INDUSTRIAL ERA 4.0**

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### **ABSTRACT**

This research aims to describe the Competency Analysis of Defense Human Resources in Facing the Industrial Era 4.0. This research uses the literature analysis method (library research), which is a series of research that uses data collection methods from various library sources such as books, encyclopedias, scientific journals and documents. The research results of Industrial Revolution 4.0 are actually a combination of digital technology trends with automation technology, of course having a broad influence on various sectors/fields, including the defense sector. In relation to defense human resources, the Industrial Revolution 4.0 can provide protection for the creation of national stability, national resilience and the unitary territory of the Republic of Indonesia. Meanwhile, the presence of the Industrial Revolution 4.0 era will give rise to new (additional) problems in the field of defense human resources, especially in the threat dimension aspect which will become more complex and new threats will emerge. So, in the end it is necessary to increase the operational preparedness of human resources to uphold state sovereignty, maintain territorial integrity and protect the safety of the nation. Aspects of the Pancasila ideology as the basis of the state, philosophy, outlook on life are basically to maintain the integrity and sovereignty of the Republic of Indonesia, but the rapid development of science, technology and information has changed people's behavior, the political aspects of people's aspirations have not been able to be channeled and accommodated properly, the economic aspects of KKN are still widespread, inequality and limited employment opportunities and socio-economic life in border areas, socio-cultural aspects of the social and cultural conditions of society, globalization and the development of science and technology can damage the socio-cultural conditions of society. The defense and security aspect are where a country that has good defense can make its people live prosperously. Not only security forces, but society must also be involved in maintaining the security of a country so that it remains stable.

**Keywords:** HR Competency, Defense Human Resources, Industrial Era 4.0

### **INTRODUCTION**

Defense Human Resources (HR) play an important role in maintaining the security and defense of a country. Defense human resources do not only consist of military members, but also involve all elements involved in maintaining the sovereignty and integrity of the country. In the context of Army Knowledge, HR has a crucial role in managing information, personnel development, decision making and organizational development. With a focus on building individual qualities and teamwork within defense organizations, readers will be given a clear view of how effective human resource management can help countries face

various modern security challenges. In the context of national defense, the contribution of human resources is vital in maintaining national security and resilience. The role of HR in defense management, the role of technology, implementation of HR development programs, the role of education, ethics and collaboration are determining factors for success in protecting the country from threats. Measuring the success of human resource development is an important step in evaluating the impact of development programs that have been implemented. The important role of education, technology, innovation, ethics and collaboration in human resource development is embedded in an



organizational culture that prioritizes individual growth in achieving common goals. Collaboration and partnerships in the defense sector are key in maintaining national security and ensuring individual readiness to face the threats of an ever-changing era. By implementing these principles, organizations can ensure readiness and sustainability in carrying out national defense duties.

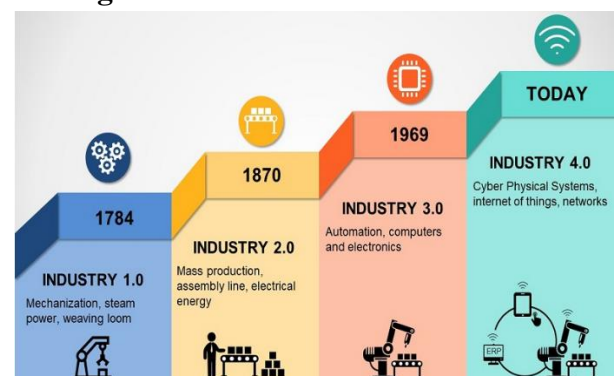
Changes in the world are now entering the era of Industrial Revolution 4.0 or the fourth world industrial revolution where information technology has become the basis of human life. Everything becomes borderless with the use of unlimited computing days and data, because it is influenced by the massive development of the internet and digital technology as the backbone of human and machine movement and connectivity. This era will also disrupt various human activities, human resource issues are one of the important elements in organizations. Human resources play a role in determining the direction and progress of an organization (Rohida, 2018). The reality is that in contemporary conditions, many human resources are lagging behind in their mastery of digitalization, so that the important role of human resources in almost every public institution is that they have not been able to adjust to cognitive mastery, it still takes a long time for human resources to respond to developments in the world of digitalization.

Building highly competitive Human Resources (HR) is an absolute and urgent need in the era of industrial revolution 4.0. This is because HR is one of the strategic resources owned by an organization, which must be continuously nurtured and developed on an ongoing basis. Having an advantage over the competition is the dream of every company, and this is not easy to achieve. One important factor in achieving this goal is optimizing

human resource management. Through a literature review, this study aims to answer the question: What is the role of competency in creating highly competitive human resources in the era of industrial revolution 4.0. There are three strategies for realizing highly competitive HR, namely increasing HR competency, education and training systems, and changing HR work culture. The Industrial Era ended the spice era. In the 1780s, the invention of the steam engine by James Watt resulted in a wave of industrial revolution throughout Europe starting from England. Countries that previously relied on plantation, mining and spice production are now starting to be displaced by countries that are capable of running mass industry. This event is known as Industrial Revolution 1.0.

In Industrial Revolution 1.0, steam engines changed the world economy. Everything that used to be done manually, at that time changed to be completely mechanical. Subsequent discoveries such as steamships, milling machines, and trains opened up new industrial sectors and increased human prosperity.

**Figure 1. Industrial-Revolution-4.0**



Source: <https://qs.telkomuniversity.ac.id>

One thing that needs to be noted is that with every Industrial Revolution, there is always a shift in the pattern of economic power. From British domination in Industrial



Revolution 1.0, United States hegemony in Industrial Revolution 2.0, to the emergence of the Asian Tigers in Industrial Revolution 3.0. This means that in the Industrial Revolution 4.0, the map of economic power will be redrawn again. This is a great opportunity for Indonesia and national industrial players to be at the forefront of the new world economic map. Human resources (HR) are considered to be the main factor to support the implementation of the industrial revolution 4.0, as planned by the government. Especially considering that the current era is entering the digital era, which demands human resource capabilities.

With the development of the 4.0 Revolution, there will be a change in the competencies that HR needs to have. The new competencies that HR needs to have in the Industrial Revolution Era 4.0 are a challenge for HR, where HR needs to know the skills that will develop and learn them so they can keep up with current developments in the Revolution Era. Industry 4.0. Human resource management is planning, organizing, coaching and supervising human resource activities, procurement, development, compensation, integration, maintenance and release to achieve various personal, organizational and societal goals. (Wajdi, 2017). Human resource management is the attraction, selection, development, use and maintenance of human resources by an organization. From this definition, it can be said that HR management is a process of utilizing people or employees, which includes receiving, using, developing and maintaining existing human resources so that they can support the organization or organizational activities. Determined by an organization in order to achieve its stated goals.

However, with the development of Industrial Revolution 4.0, various challenges will be faced by Defense Human Resources (HR). The main challenge that Human Resources will experience is the loss of jobs that will be replaced by technology. According to (Karnawati, 2017) in Slamet Rosyadi, Industrial Revolution 4.0 in the next 5 years will eliminate 35% of types of work. In fact, in the next 10 years the jobs that will be lost will be 75%. This is caused by the changing role of work carried out by humans and being replaced step by step by program digitalization technology. Based on this explanation, the emergence of the Industrial Revolution 4.0 will require human resources to be able to think more creatively in managing work and to be able to also apply technology to the field of work being carried out. This aims to train human resources in using technology that has been developed. Apart from being able to apply technology in the field of work being done, human resources also need to have several competencies to face the Industrial Revolution 4.0.

In the industrial revolution 4.0, human resources maintain competence to face the industrial revolution 4.0, such as the ability to think critically and make decisions, the ability to solve problems, the ability to think innovatively, the ability to communicate and collaborate, the ability in the field of science, the ability to hold responsibility, the ability to or emotional intelligence (Emotional Intelligence), social ability to adapt, ability to lead (Leadership), Creativity, Ability in the field of technology. By having one of these competencies, it will support HR's ability to face the Industrial Revolution Era 4.0. They need to have competencies that are in line with the developments of the Industrial Revolution 4.0. With the development of the Industrial



Revolution 4.0, the government needs to provide facilities for defense human resources in Indonesia to be better prepared to face the Industrial Revolution 4.0. According to (Satya, 2018), the Indonesian government has a strategy to face the industrial revolution 4.0. This strategic step is to encourage the Indonesian workforce to further improve their abilities and skills in using IoT (Internet of Things) technology, utilizing digital technology to spur productivity and competitiveness. , Optimal use of digital technology is Indonesia's vision in the era of industrial revolution 4.0.

## **LITERATURE REVIEW**

### **Competence**

Competency refers to a person's knowledge, skills, abilities or personality characteristics that directly influence their job performance. In a company, each job has different skills. Competencies are guidelines that companies can use to demonstrate appropriate work (Arief & Nisak, 2022). Competency is the ability to perform or work according to one's position in a particular field (Eksan, 2020). In organizations, human existence has a very important role for the organization because the success of an organization is greatly influenced by quality. Work competency is a map of an employee's skills according to the characteristics of the work they do and is a collection of skills, abilities, experience, efficiency, effectiveness and success in carrying out their responsibilities (Oh & Novita, 2018).

### **Defense Human Resources**

Human Resources (HR) are the main element that determines the success of implementing national defense, facing increasing threats today. Mastery of technology is absolutely necessary along with

the development of increasingly sophisticated defense technology but must be accompanied by human resource expertise. The skills needed are the ability to operate, produce independence and develop technology to reduce foreign dependence. The current fourth generation of war forces every country to coordinate all its national resources as a defense force. Indonesia's abundant human resources can be used as a defense force, but it must be supported by an adequate defense industry to provide effective weapons technology. Professionalism in defense human resources is also needed by involving civilians in managing defense in the future.

### **Industrial Era 4.0**

Industrial Revolution 4.0 or what is often called cyber physical system is a revolution that focuses on automation and collaboration between saber technology. The 4.0 revolution itself emerged in the 21st century with the main characteristic being the integration of information and communication technology into the industrial sector. According to (Merkel, 2014) who states the meaning of industrial revolution 4.0 as a comprehensive transformation of all aspects of production that occur in the industrial world through the combination of digital technology and the internet with conventional industry. Apart from that, according to (Schlechtendahl et al, 2015) defines the industrial revolution which emphasizes the element of speed of information availability, namely an industrial environment where all entities can always be connected and able to share information easily with each other.

## **METHOD**

This study uses the literature analysis method (library research). Arikunto, S., 2014 said the library research method is a series of



research that uses data collection methods from various library sources such as books, encyclopedias, scientific journals and documents. which involves collecting data from various literature sources related to Defense Human Resources. Relevant data is then analyzed qualitatively to identify factors that influence employee performance. Based on a literature study conducted, Competency of Defense Human Resources in Facing the Industrial Era 4.0.

The aim is to critically examine and review existing knowledge, ideas and findings in relevant academic literature, as well as formulate theoretical and methodological contributions to the topic under study (Adlini, MN, et al., 2022). The focus of this research is to find theories, postulates, principles, or ideas that can be used to analyze and solve research questions that have been formulated. This research is descriptive in nature, where the data that has been collected is analyzed systematically to provide a clear understanding and explanation.

## RESULT AND DISCUSSION

### The Importance of Developing Defense Human Resource Competencies in the Industrial Era 4.0

The era of industrial revolution 4.0. This is a very dramatic change and is happening at an exponential rate. In other words, the speed of increase is a fixed percentage of the total at a certain time. Apart from that, this will also give rise to various opportunities and potential problems which will have consequences for changes in the quality of Human Resources (HR) and have implications for changes to existing standards. In parallel, the Defense implementation sector when facing the industrial revolution 4.0 must also be followed by the development of Defense HR

capabilities. Please note that Industrial Revolution 4.0 was first initiated in 2011 by Germany, which then became the main theme at the 2016 World Economic Forum (WEF) meeting in Davos, Switzerland. Several countries already have programs to support their industries towards Industry 4.0, such as Germany, England, the United States, China, India, Japan, Korea and Vietnam. Entering the era of the Industrial Revolution 4.0, what is becoming a trend in the world is the combination of automation technology trends with cyber technology which includes physical cyber systems, the Internet of Things (IoT), cloud computing and cognitive computing.

The trend in this era or period is automation and data exchange, which has also changed human life, the economy, the world of work, and even lifestyle. The Industrial Revolution 4.0 has transformed the separation of physical space from digital, synthetic and organic space, as well as the power of exploratory thinking (creative thinking and mathematical disposition) into hyperbolic (exaggerating reality to make it unreasonable). The complexity of the threat problems currently occurring has a dimension of mastery of technology which will play and have a key role. In this regard, there is Utilization (utilization and use) of defense space along with the development of automation. Without realizing it, the automation of defense threat problems is increasingly multi-dimensional, complex, changing and unpredictable. Probability (a measure of the chance of a threat occurring) in the era of the defense industrial revolution has made it inevitable that the form, nature and format of new threats will be born. The reality of these various problems and questions, of course, creates an urgency and rationale for



realizing a tough and strong national defense, as an effort to uphold state sovereignty, defend the territorial integrity of the Republic of Indonesia, and protect the safety of the entire nation.

### **Opportunities and Challenges for Defense HR Competency in the Industrial Era 4.0**

The fourth wave of the industrial revolution (4.0) is a continuation and of course still relies on the Third Industrial Revolution (3.0). This condition is marked by the unification of several technologies, so that we see and feel a new era consisting of 3 (three) independent fields of science, namely: physics, digital and biology. This is also marked by the rapid development of the Internet of/for Things. The Industrial Revolution 4.0 will bring many changes with all its consequences, which from the positive side is the existence of connectivity so that there is a level of effectiveness and efficiency. However, on the negative side, there is a risk of reducing Human Resources (HR) being replaced by machines or robots, demands for the quality and competence of HR, so that they can be more competitive in the current era of technological transition. The most important thing is the impact and influence of the industrial revolution 4.0 on defense aspects.

Defense is viewed from the apex of geostrategic insight (astagatra) which is static (trigatra), showing (1) the geographical condition of Indonesia consisting of islands and located at a crossroads for international traffic, (2) the heterogeneous condition of Indonesia's population, its distribution and the level of education and level of welfare are not evenly distributed, and (3) Indonesia's abundant natural resource potential indicates that people's welfare is certainly sufficient, even abundant. The Dynamic (Pancagatra) aspects are seen from: (1) Ideology. Pancasila

as the basis of the state, philosophy, way of life is basically to maintain the integrity and sovereignty of the Republic of Indonesia, but the rapid development of science, technology and information has changed people's behavior, (2) Politics. People's aspirations have not been able to be channeled and accommodated properly, political conditions are not conducive, and the implementation of a multi-party system has left many problems that are vulnerable to friction and conflict, (3) Economy. KKN is still widespread, there are gaps and limited employment opportunities and socio-economic life in border areas, so these conditions have the potential for vulnerability in various fields, and (4) Social and Cultural. The social and cultural conditions of globalization and the development of science and technology can damage the social and cultural conditions of society. Meanwhile, viewed from the perspective of (5) the defense and security aspect, a country that has good defense can make its people live prosperously. Not only security forces, society must also be involved in maintaining the security of a country so that it remains stable. Defense and security are the main foundations of human resources for national resilience. Citizens, as supporting elements, have the right and obligation to participate in national defense efforts. In this context, the role of the TNI and Polri as the main forces in involving the people is crucial to maintaining peace and security stability.

The accumulation of conditions mentioned above is a reflection and description of the reality of Indonesia's conditions. However, with the fourth wave of the industrial revolution (4.0) with all the dynamics of change and its impacts, all of this will have implications for the condition of national stability, national resilience and national defense. The world is currently



paying close attention to the industrial revolution 4.0. There are positive consequences as opportunities, as well as negative consequences as challenges that must be faced.

### **Opportunities for Defense HR Competency in the Industrial Era 4.0**

The presence of the industrial revolution 4.0 has indeed brought new businesses, new jobs, new professions that were previously unthinkable, namely the emergence of transportation with a ride-sharing system (application-based). With this composition, the Industrial Revolution 4.0 has the potential to empower individuals and society, because this phase of the industrial revolution can create new opportunities for economic, social and personal development. Why is the current transformation not an extension or continuation of the digital revolution, but rather a new transformation revolution (in itself). In general, the industrial revolution 4.0 is a transformational revolution through integration between the internet or online world and the industrial world, so that various industrial processes are supported by the internet. Agree, that the industrial revolution 4.0 will have implications for various developments in digital and automation-based defense systems, and can give rise to new threats. This should be addressed through increasing capabilities, as well as Minimum Essential Force (MEF) defense 4.0.

As a first step in implementing the Defense Strategic Plan and MEF 4.0 Program, the focus of implementation is education, training, competency, research and development. Furthermore, at the level of the defense industry, which is the backbone and support of national defense, it is hoped that the industrial revolution 4.0 can have a big

influence in terms of the competitiveness of its contribution to national defense 4.0. So that in the end it will lead to independent defense human resources that are able to compete in Asia and the world. Another opportunity is that Defense Industry 4.0 in Indonesia is becoming an attraction for foreign and domestic investors in Indonesia. Apart from that, domestic industry can be more productive and better, accompanied by increasing the ability of human resources to adopt technology, so that it can compete with other countries. From several descriptions of the opportunities that will be obtained from the presence of the industrial revolution 4.0, we need to change the mindset, paradigm, doctrine and culture related to this change is an opportunity and challenges and change is an inevitability that cannot be avoided and technology is not difficult, by trying to continue -Continuously improve learning abilities, skills that are in line with the needs of the industrial era 4.0.

### **Defense HR Competency Challenges in the Industrial Era 4.0**

On the challenge side, the Industrial Revolution 4.0 can cause various problems for the Indonesian nation. In particular, there is widespread stunting and marginalization of a group which can worsen social interests, social cohesion, and can even damage interrelationships between people. Apart from that, it can also create security risks and create the risk of new threats to national defense from the impact or influence of the Industrial Revolution 4.0.



Figure 2. Making Indonesia 4.0



Source: <https://ppid.menlhk.go.id>

Entering Indonesia's industrial revolution 4.0, whether we realize it or not, will also have consequences for aspects of defense human resources related to threats. For this reason, the precautionary factor is very necessary for all elements of human resources which will harm national stability, national resilience and even the territorial sovereignty of the Republic of Indonesia. For this reason, in the future it will be directed at developing the main components of human resource capabilities through increasing knowledge and increasing skills, increasing the portion of research, as well as research and development through the APBN scheme. Apart from that, a form of anticipation of this challenge is to provide incentives for developing the quality of Defense Human Resources. And what is even more important is optimizing the important role of human resources to react in overcoming the nation's problems from the impact and influence of the industrial revolution 4.0 so that Indonesia's national resilience is maintained.

## Comprehensive Development of Defense Human Resource Capabilities in the Industrial Era 4.0

The era of industrial revolution 4.0 has the consequence of demanding changes in the quality of Human Resources (HR) and bringing disruption and implications to existing standards. To face the industrial revolution 4.0, massive and comprehensive development of human resource capabilities must be followed. To realize these efforts, leaders are needed who are open minded and ready to face very rapid, changing and unpredictable changes in situations. Apart from that, a leader is also needed who has a results orientation (result oriented) and not a procedure orientation (procedure oriented) and must be able to synergize with all work systems related to his duties and functions. The presence of the Industrial Revolution 4.0 will give rise to the influence and impact of various forms, characteristics and types of new threats. The influence of the Industrial Revolution 4.0 on new threats, creating defense policies that include developing the country's defense strength and capabilities in a comprehensive and sustainable manner.

The revolution that focuses on developing Defense Human Resources is developing HR capabilities in terms of capabilities and strengths of the main components. The development of capabilities and strengths in question is through an education and training system that leads to digitalization and automation, research and development, as well as competency-based organizational staffing. The Industrial Revolution 4.0 will create a Professional, Effective, Efficient and Modern (PEEM) defense. Apart from that, defense operational preparedness will be higher by synergizing the integrated Tri Matra force pattern in facing





various problems arising from the influence of the Industrial Revolution 4.0.

## CONCLUSION

Based on the results of the research and discussion in the previous chapter, it can be concluded as follows:

1. The Industrial Revolution 4.0 is actually a combination of digital technology trends with automation technology, of course having a broad influence on various sectors/fields, including the defense sector. The essence of the Industrial Revolution 4.0 was first initiated in 2011 by Germany, which was a continuation of the Third Industrial Revolution (3.0), marked by the unification of several technologies, so that we see and experience a new era consisting of 3 (three) independent fields of science, namely: physics, digital, and biological which can increase "Efficiency" and "Improve the quality of results".
2. In relation to defense human resources, the Industrial Revolution 4.0 can provide protection for the creation of national stability, national resilience and the unitary territory of the Republic of Indonesia. On the main component aspect, HR is expected to be able to provide efficiency in developing main component HR capabilities. However, if we are faced with the process of combining digital technology with technology resulting from the impact of the Industrial Revolution 4.0, this will affect the demand for technological modernization.
3. Meanwhile, the presence of the Industrial Revolution 4.0 era will give rise to new (additional) problems in the field of defense human resources, especially in the threat dimension aspect which will become more complex and new threats will

emerge. So in the end it is necessary to increase the operational preparedness of human resources to uphold state sovereignty, maintain territorial integrity and protect the safety of the nation. The ability to respond and adapt to the influence of change in the era of the Industrial Revolution 4.0 in maintaining national stability, HR resilience is essential and urgent because it is technology-based. In the end, it is hoped that the influence of changes in the Industrial Revolution 4.0 era will bring better social welfare and create more resilient human resource conditions for defense, national stability and national resilience.

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