Human Resource Quality Strategies of Fulfilling the Needs for Digital Talent in Society 5.0.

Novriana[1], D S Soegoto[2]

[1,2]Department Magister Management, Universitas Komputer Indonesia, Indonesia,
Jalan Dipatiukur No. 112-116 Bandung 40132, West Java, Indonesia

E-mail: Novriana.75222006@mahasiswa.unikom.ac.id

Abstract. Human Resource Management Strategy is one of the important factors in the success of industry 4.0 in Indonesia, competent human resources will be the determinant of how technology produced in this era can be used for the benefit of human society 5.0. The industrial revolution may be viewed as a change in the human way of life and a fundamental process of work. The industrial 4.0 saw the development of information technology that integrated two worlds; The world of life with the digital world, which has obviously affected various disciplines. Basically, industrial 4.0 and society 5.0 have no deep difference, but society concepts focus more on humans as the primary components in which humans are able to create new values through technological development. They believe can minimize the disparity between humans and economic problems in the future. Indonesia was expected to enter the society 5.0 era in 2045, the factors affecting Indonesia as late as it was entering the era, one of which is human resources, at which time human resources are required to have the basic skills of digital technology, creative thought, creative problems, collaboration, and critical thinking. Research using qualitative methods, that collective literature studies that review or critically review the knowledge, ideas, or findings contained in journals, books, and other scientific works. The era society 5.0 is expected to contribute significantly to human resources in Indonesia to prepare digital talent with superior, innovative and competent skills. The competency skills that must be owned by digital talent in Indonesia among others: 1) Early English recognition, 2). Understanding of computer coding to train reasoning, 3). Mentorship and coaching from world-class instructors, 4). Understanding of statistical and psychological sciences and 5). Maintenance of training and certification.

1. Introduction

Human life is beginning to grow on into a great revolution at the time of the introduction of 4.0 industry. Human life is influenced by digital technology in various ways, namely economic, social and political as well as in the personal life of human beings [1]. In 2011 the term industry 4.0 became publicly known, it began when the association of business, politics and academics introduced the idea as an approach to strengthening competitiveness in the manufacturing industry in Germany [2]. Industry 4.0 continues to grow because society is constantly evolving and learning, therefore industry 4.0 and society is a reciprocal relationship that must continue to be maintained and developed.

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From some previous studies, we found a summary if the development of the industrial revolution 4.0 is driven by digital technology, where artificial intelligence is combined with the internet of things (IoT) backup with big data that is capable of processing data on a large scale and describes a virtual condition by providing solutions to make decisions appropriately, effectively and efficiently. In connection with the development of the industrial revolution 4.0 developed countries began to do later following the changes that occurred by creating the concept of Society 5.0. This concept was born because industry 4.0 is considered to have the potential to degrade human roles [3].

Therefore in 2019 the Japanese state initiated the concept of Society 5.0 where the concept is human-centered and technology-based and is an improvement of previous concepts [3]. Indonesia can be said to have not been perfectly underway and the trend of this era will have an indirect impact on Indonesia as one of the developing countries that are required to play an active role in preparing human resources in the face of the challenges of the Society 5.0 era in the future [1]. Education issues in Indonesia are considered very complex, therefore Indonesia needs a solution that must be reviewed from the current system's point of view, globally Indonesia currently ranks 71th out of 77 countries, reviewed from the average mathematical, IPA and reading. Indonesia is at a rate of 11.9% for the category of countries that have completed higher education ages 25-64 years, the value is lower than the average level of education in OECD countries that have an average value of 39.9% such as Canada with a percentage of 56.7%, Japan 51.4%, Israel 50.9%, Korea 47.7% and the Americas 46.5% [4].

In a press release the coordinating ministry of the Indonesian economy must be ready to face changes towards the Society 5.0 where most of the information and sensors of physical territory will be accumulated into virtual territory and the results will be returned to physical territory to be utilized by the community. Therefore, the development of digital talent is needed and improving digital literacy to the community. The Minister of Economy also directed that all stakeholders from government, community, academia, entrepreneurs and media, where the government becomes facilitators and regulators, while the academic element is expected to be the originator of a good entrepreneurial curriculum and encourages the creation of more startup companies [5]. The research aims to discover the concept of industrial development and how Indonesia as a developing country must compete in the era of Society 5.0 to prepare competitive digital talents. This research using literature study that discusses the concept of Society 5.0, the application of Society 5.0 and the readiness of Indonesian digital energy in the face of the trend in the future, As for the concept or theory that becomes the material of discussion is obtained through paper, official website, book, news. And the results obtained from this study are summarizing competencies and soft skills that must be owned by digital talents in Indonesia.

2. Research Method

This research uses qualitative research methods to get deeper data, which means meaning and is the actual data. Research with this method emphasizes the discovery of new concepts, knowledge or even theories but not to test existing theories. One characteristic of qualitative research is descriptive where the data in this study is in the form of words or images, but not in the form of numbers [6].

The data collection is done with the study of literature that reviews and analyzes interpretations from written sources based on the context, the source can be published records, textbooks, newspapers, magazines, film letters, diary notes, manuscripts, press release or articles. Using this method, researchers are expected to get conclusions and suggestions to improve existing practices. To get the conclusion researchers must collect data in the form of theory and relate to the industrial revolution to the trend of society 5.0 relating to how digital talent fulfillment strategies in Indonesia to get quality talent and compete in the era of Society 5.0.

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3. Literature Review

3.1 Industry Revolution

Industrial Revolution can be said to be a process of change or revolution of an industry that evolved in every phase [7]. The development of the industrial revolution also influenced the development of technology made by humans, where it influenced human life [8]. The lifestyle and thinking of a nation and state are the basis of the industrial revolution occurred, such changes can change and make the order of the life of society change, ranging from political, economic, social and cultural aspects [9].

3.1.1 Industrial Revolution 1.0 and 2.0

Changes occurred largely in the industrial revolution 1.0, especially in agriculture, mining, transportation, manufacturing and technology marked by the invention of steam machines in the 18th century (1800-1900) where it slowly replaced power and humans and animals into engaged machinery power with mechanical systems [8]. The key factor of the success of the industrial revolution 1.0 is due to the development of science that has evolved since the 16th century [9]. After the industrial revolution 1.0 ended in 1900, it continued with the industrial revolution 2.0 in 1900 - 1960 by developing existing machines, which encouraged rapid industrialization, this is characterized by the inventions that have significantly changed the face of the world, such as mechanisms and mass production systems, the invention of power plants, cars, telephone aircraft to aircraft that facilitate human displacement separated by distance.

3.1.2 Industrial Revolution 3.0 and 4.0

The Industrial Revolution 3.0 occurred between 1960 and 2010 that began with the invention of the internet and also digital technology controlled by robots and systems were computerized so that many industrial equipment had not used human power [9]. During the industrial revolution 3.0 many innovations were made, including the utilization of electronic hardware integrated with software [10], this can certainly encourage the digitalization system not to make space and time a barrier to the effectiveness of work and change the pattern of relations and communication of society in general.

Technology found in the 3.0 industrial revolution include: 1). Access to internet networks and 2). Computerized technology systems. After the industrial revolution 3.0 ended, the industrial revolution 4.0 began, marked by the relationship between humans, machines and data, all of which were united in virtual [11]. One of the advances of the industrial revolution 4.0 was the existence of big data, artificial intelligence (AI), and this era is known as digital systems that allow all machines to connect with internet systems [12]. With the industrial revolution that is computerized, it can be an opportunity and a threat to humans, where jobs will be more less.

3.2 Society 5.0

The study of the era of industrial revolution 4.0 is considered to shift the role of humanity making Japan initiate the concept of Society 5.0, where through this concept is expected the transformation of big data collected over the internet in all areas of life into artificial intelligence so that it can improve human ability to open new opportunities [4]. The implementation of Society 5.0 aims to solve various social challenges and problems using innovations that have been used in the 4.0 industrial revolution such as the use of IoT, big data, AI and robotics. There are 3 values that are closely related to Society 5.0: 1) Human-centered, 2). Sustainability and 3). Resilience. Ultimately, Society 5.0 is expected to realize intelligent innovation through improving and equalizing the quality of life, expanding access and relevance to bring happiness to everyone [13].

3.3 Digital Talent

Indonesia is ranked 56th in the Digital Competitiveness ranking; the survey considers various factors, namely knowledge, technology, future-readiness, expertise in the digital sector, and the number of digital talents in a country [14]. The Ministry of Communication and Information said that the digital talent capabilities needed include the ability to adapt to new technologies, cloud computing, cyber

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security, IoT, machine learning, AI and big data analysis. It also requires multimedia and animation skills, programming, graphic designers. In addition, digital experts also have digital communication capabilities, digital policies, digital entrepreneurship, financial technology, and business intelligence. From the explanation it is known that digital talent is needed to make Indonesia a country that can compete internationally [15].

4.   Result and Discussion

4.1 Indonesia Strategy Faces Society 5.0

Society 5.0 concept is a refinement of the concepts of the previous industrial revolution. Society 5.0 can minimize the inequality in humans and economic problems that create new values and lifestyles, in addition, the Society 5.0 Artificial Intelligence also takes into account the humanitarian side by transforming millions of data collected over the internet in all areas of life. In industry 4.0, it is said to be the phase in which CPS and IoT are integrated into industrial processes that include manufacturing, logistics and other processes. Cyber physical system (CPS) conceptual and IoT integration [20] can be seen in the following image:
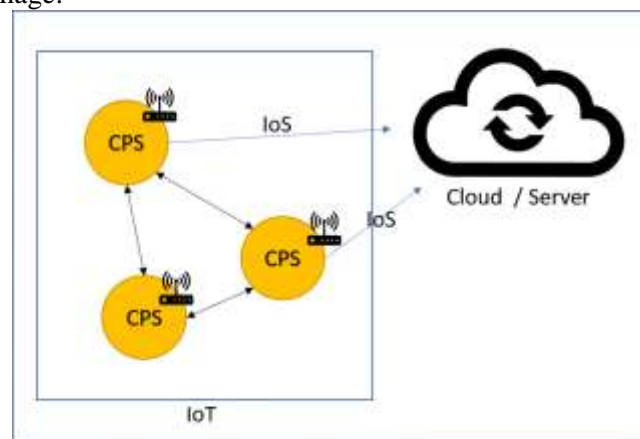

Figure 1. Cyber Physical System And IoT Integration Concept

If in industry 4.0 there is integration between physical systems, computing and network or better known as cyber physical system (CPS) with IoT, society 5.0 is a refinement, where humans are not only used as object (passive elements), but also actively as subjects (active players) who work with the physical system to achieve the goal [13].
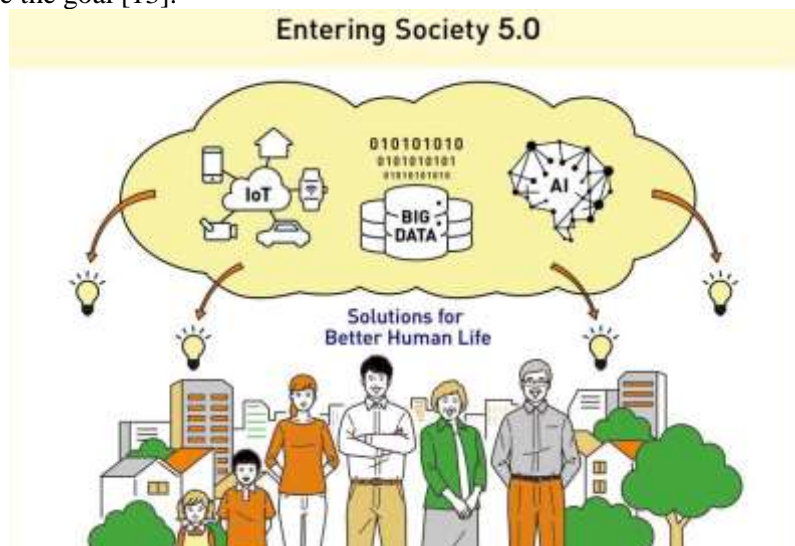

Figure 2. Society 5.0 Concept

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Indonesia as a developing country that is on the wave of industrial revolution 4.0 with rapid digitization growth, but it is still lagging behind compared to other countries in the world caused by low digital talent and digital literacy and inadequate regulatory support [16]. Digital Transformation in Indonesia that is still growing and sooner or later will make all aspects of life in contact with digitalization, however, on the other hand, there is a digital divide between regions or community groups in the city and village. This gap will certainly lead to inequality in the various lines of people's lives and require the government as a regulatory holder to develop sustainable digital development to bring progress and well-being to all communities.

Based on [16] Indonesia will enter the era of super smart society in 2045, therefore human development is necessary to become the main driver for sustainable development in Indonesia. The government itself has actually wanted so that every city to village in Indonesia can reach the level of smart city, however, based on [17] emphasizing that a city can be said to be intelligent as seen by how information systems run in the city, the approach to intelligent cities can be seen from several aspects such as: transportation, economy, governance, environmental issues, energy consumption, education services and health services, but when it comes to industry 4.0 and Society 5.0, it is certainly important to know the role of information technology.

Based on [5] Indonesia has a demographic that supports the development of sustainable digital ecosystems, where the majority of the population of Indonesia is 8 to 39 years old who have a high digital adoption rate. In addition, which is a factor in developing Society 5.0 in Indonesia is also a collaboration between the government as stakeholders and higher education institutions or universities given the complexity of education problems in Indonesia and to improve competitiveness by analyzing learning methods and preparing human resources in the face of industry 4.0 and readiness in entering the era of Society 5.0.

4.2 Opportunities And Challenges For Indonesia

Digital Transformation in Indonesia has opened up new jobs that were not previously available, but also impacted the type of work that will be lost and replaced by machines. To transition from industry 4.0 to society 5.0, Indonesia should accelerate the change simultaneously and make the process a national road map or blueprint to ensure national interests and the existence of the nation, according to [13] it is necessary to prepare rules and regulations that are compiled to protect industrial workers from threats during the transition of industry 4.0 to Society 5.0. The EV-DCI 2022 survey showed that the majority of digital companies felt the lack of a capable workforce in the digital field. According to the respondents, three key aspects that need to be improved are practical implementation capabilities, specific digital capabilities, and coupled with adequate experience. In general, the weakness of Indonesian employee candidates regarding digital capabilities [18] can be seen in the following table:

Table 1. Weakness of Indonesian Candidates Regarding Digital Capabilities

No	Weakness	Percentage
1	Implementation ability is not adequate, it is still theoretical	56,3%
2	Abilities are too common	50,7%
3	Inadequate experience	49,3%
4	Very long adaptation to finish digital Problems in the Company	36,6%
5	It does not have digital capabilities enough with the company's needs	32,4%
6	Remuneration Level asked too high	28,2%
7	None	5,6%
8	Others	2,8%

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Preparation for Society 5.0 requires commitment from all parties, both governments and entrepreneurs to focus on implementing upskilling, social security net and funding so that existing human resources can be an agent of technology, and in conjunction with that, it is expected to continue to grow the national strategic industry which includes digital industries based on AI, IoT, Augmented Reality (AR) and machine learning. But on the other hand, there are several challenges in the implementation of digital technology, namely not the uneven infrastructure, lack of human resource competence, and weak coordination between stakeholders ranging from central to regional level [19].

4.3   Fulfillment Of Digital Talent Needs In The Implementation Of Society 5.0

Digital talent needs are expected to continue to increase each year. The Ministry of Communication and Information stated that Indonesia still lacks about 9 million digital personnel to carry out digital transformation [15]. According to data, by 2030 the country of India is expected have digital talent surplus of up to 245 million people, whereas Indonesia will have a digital talent shortage of up to 18 million, this will certainly be a threat to human resources in Indonesia if it does not find a solution immediately.

Human Resources Management is homework for all parties, and this causes a lack of digital talent in Indonesia, because as good as infrastructure and technology will be in vain if not accompanied by quality and competent human resources. Basically, the standard of competence required for resource management processes and how to implement them. In Indonesia, Indonesia has previously established the Telematics Coordination Team (TKTI), but over time there came the view that the TKTI was no longer relevant to the development of technology, the National Information and Communication Technology Council (WANTIKNAS) is tasked with formulating general policy and strategic direction through empowering information technology and prepare blue print and information technology roadmap to determine the steps that must be taken to realize knowledge-based Indonesian society [19].

This is supported by a statement of employment ministers explaining that if the workforce must improve competence so as not to be left out by technology. Digital talent ecosystem should also be considered as a campus as an educational world and a place where people will increase their knowledge and improve their skills, the world of professions related to how human resources perform tasks, trust and responsibility for their work, business and industry places to earn income and awards. as well as regulations from the government that will maintain equal equalization and equal rights to get employment opportunities. Based on [19] to be able to develop digital talent in Indonesia at least the government can do the following:

a. Early English recognition required since elementary school or the addition of other foreign languages since high school, this is intended to allow human resources to have the ability to communicate internationally.
b. Computer programming and coding, there is a exposure to programming and reasoning languages to develop specialization and capabilities and can be applied directly when entering the workplace.
c. Mentorship and coaching from world-class teachers to create world-class universities. By gaining new knowledge from global experts, it will train young people of Indonesia and provide a vocation oriented to the workforce.
d. Understanding of statistical and psychological sciences useful for creating a data-based mindset, expertise in human resource management and scale and information as the foundation of policy-making.
e. The maintenance of training in accordance with the specialization of the workforce through the stimulus program, One of them is digital talent scholarship (DTS) training that is continuously conducted to increase human resources knowledge and capabilities.

In addition, based on [13] the era of Society 5.0, everyone should have the following soft skills:

a. Leadership, that is a leader who can unite and provide clear direction and objectives. A leader in this era must have the speed of adoption of new technologies and the speed of deciding everything quickly

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according to data and facts so as to minimize the risk of failure, as well as brave, accept, encourage and motivate teams to feedback their leadership style.

b. Language skill in many foreign languages must be prepared especially English because after 2020, it is estimated that cognitive ability becomes the required skills and then followed by system skills, complex problem solving skills and process skills.

c. IT Literacy is used to compete in the IT world, which is the focus of the concept of Society 5.0 and is part of cognitive flexibility where it demands brain ability to switch and think about new unexpected conditions associated with work conclusion.

d. Writing Skills that can provide emotional sensitivity and provide critical thinking to produce writing or publication for self-development and the world. In addition, writing skills can also encourage the level of scientific publication that is an indicator of the level of education and quality of education in the country.

5. Conclusion

Society 5.0 was initiated by the Japanese government in 2019 as the continuation of the 4.0 industrial concept, where the concept of industry 4.0 focuses on the development of AI which is its main component whereas society 5.0 focuses on AI that transforms millions of interconnected data over the internet in all areas of life. If in industry 4.0 is known as the cyber physical system (CPS) which is the result of integration between the physical system and the network, so in Society 5.0 the concept was refined to cyber-physical-human system, where humans are not only used as objects, but actively actively become subjects who work with the physical system in achieving the main objectives and social order of society. In the realization of Society 5.0, the goal of creating a society that can solve various social challenges by making the results of the industrial revolution 4.0 a tool for industrial and social life. By doing that, society in the future will be a society that creates new values and services so that it makes human life more harmonious and sustainable. Indonesia as a developing country is in a phase of digital transformation that is still growing despite being left behind compared to other countries such as Singapore, UAE and New Zealand, this is due to Indonesia's digital competitiveness in 2020 which is still low, which is 54th out of 64 countries and is also caused by low digital talent and digital literacy and inadequate regulatory and technological support. Indonesia is expected to actually enter the era of Society 5.0 by 2045, but there are still some challenges that demand involvement of all stakeholders and policy stakeholders including the education world to accelerate this process. Based on data, by 2030 it is estimated that Indonesia will experience a shortage of digital experts of 18 million, this is inversely compared to the Indian country which by 2030 is expected to experience an excess of digital experts of 245 million people. To continue preparing digital experts in Indonesia, some steps to take are 1) Early English recognition added with mastery of other foreign languages since high school, 2). Understanding of computer coding to train reasoning, 3). Mentorship and coaching from world-class instructors, 4). Understanding of statistical and psychological sciences for decision making based on data and human resource management and 5). Maintenance of training and certification to improve the value and competence of human resources.

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