

Digital Transformation in Human Resource Management in the Industrial Age 4.0

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Abstract

The global world has entered the era of industrial revolution 4.0, which demands the speed of production flexibility and increased service to consumers. The age of the industrial revolution 4.0 has transformed various sectors into more practical and complex ones through the use of automated and digitized technology. This research aims to discover digital transformation in improving human resource management that is superior, creative, and innovative in the corporate sector. This research method uses a qualitative approach, with the type of literature review research. The data sources used are secondary data sources by reviewing journal articles and secondary data from books to support this research, all of which are by the research objectives. The results show that digital transformation will result in intense competition and compete with each other in facing the demands of industrial revolution 4.0. Therefore, the abilities and skills will result in superior performance and HR achievement

Keywords: Digital Transformation; Human Resource Management; Industrial Age 4.0

1. Introduction

The prediction exacerbates Indonesia's problems that from 2030 to 2040, the number of people classified into the productive working age will be more than the size of the unproductive population. It is estimated that it reaches 64% of Indonesia's total population or 297 million people. Thus, the productive working-age population is obliged to have better abilities to compete in the available jobs. The transformation that took place during the industrial revolution influenced the quality of the workforce because the skills needed would also change. Therefore, the main problem is for the development or not development of citizens of a country is a problem for the workforce (Dwina Kuswadani, Dhami Johar Damiri, 2020). The global world that has entered the era of the industrial revolution 4.0 also demands the speed of production flexibility and increased service to consumers. The age of the industrial revolution 4.0 has transformed various sectors into more practical and complex ones through the use of automated and digitized technology (Utami & Kusumawati, 2021).

Indonesia is faced with problems in terms of human resources, which requires fixing three main issues, namely low labor skills (soft skills), the mismatch between employment and available skills (skill mismatch), and unfulfilled job opportunities by skilled workers—skilled and adequate (skill shortages). The pace of technological change brought about by industry 4.0 has created a significant gap between the capabilities of today's employees and their rapidly evolving requirements. It is estimated that existing jobs have the potential to be automated by adapting new technology by 50%; although less than 5% of existing jobs can be fully automated by 60%, about 30% or more of their activities can be technically automated as much as 52.6 million jobs also have the potential to be replaced by a digital system model (Novelia et al., 2022).

According to Prof. Dwikorita Karnawati (Predy et al., 2019) Industrial revolution 4.0 in the next five years will eliminate 35 percent of the types of jobs; even in the next ten years, the types of jobs lost will increase to 75 percent.

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This is because the work played by humans is gradually being replaced with program digitization technology. As a result, the production process becomes faster and easier to distribute massively with minimal human involvement. In the United States, for example, the development of the online banking system has facilitated the transaction process for banking services. As a result, 48,000 bank tellers had to face layoffs. Communication technology, information, and new media that have succeeded in changing the pattern of communication and information seeking have become a major contributing factor in changing people's lifestyles, especially in the communication and information-seeking styles. (Perdana, 2019).

To anticipate the current industrial era 4.0, it is necessary to carry out digital-based HR transformation through various innovations in the field of Human Resources (HR) management, which is an essential key in facing the era of disruption. In addition to technological adaptation, structural changes in processes, and capacity building of human resources (Wardhana, 2021). Human resources in a company are considered a long-term investment and an essential factor in the fate and success of any business and the company's profitability. Most applicable HRM models emphasize strategic and structural alignment with organizational goals and focus primarily on rationality and control objectives. On the other hand, the "old-fashioned" HRM model associated with social value orientation and the promotion of well-being in the workplace still influences HR managers' decisions and practices (Kusuma, 2021). In the theory of Human Resource Management, according to Rivai (Permatasari et al., 2018) One of the most critical factors in an organization is its human resources. Whether or not the human being in the organization can be measured by performance. After all, technology and machines are artificial; it is appropriate for humans to master technology and devices, not the other way around. In human resource management, technology helps many complex processes that require high accuracy. However, humans as the company's principal capital cannot be ignored entirely and replaced. Technological sophistication can make job designs change considerably. Therefore the demands for competence in human resources also change. HR managers will be required to function more in strategic positions, with the understanding of solving strategic problems, especially those related to human resources, and ultimately improve company performance. HPWP (High-Performance Work Practices) in HRM (Human Resource Management) must constantly be improved with technical support to produce superior performance compared to HRM of conventional companies (Budihardjo, 2019).

The development of digital capabilities is essential for organizations to be better prepared to implement the progress of the industrial revolution 4.0. Digital power refers to digital alignment where digital conformity relates to organizational culture, people, structures, and tasks. Therefore, preparing human resources with digital talent and skills by proposing a conceptual framework for industry 4.0 is the main focus in this era.

2. Literature Review

2.1. Digital Transformation

Digital transformation is a term used in academics to refer to organizational changes influenced by digital technology. Digital transformation occurs because of technological developments in organizations and the environment. Changes that occur are related to business process adjustments, including differences between the company and its employees and the company and its customers, as well as changes in current market conditions (Dwina Kuswadani, Dhami Johar Damiri, 2020; Muskania & Zulela MS, 2021; Ricky Oktavenus, 2019). Refers to Verhoef (Widnyani et al., 2021) Digital transformation and business innovation change customer expectations and behavior, suppressing traditional companies and market disruptions. Changes in customer needs and behavior also force companies and general administration to excel in digital transformation, so many business sectors require change, and digital transformation is a process carried out by organizations or companies. Digitalization has a broader meaning, which refers to using digital technology or information already in digital form to create and obtain new value in new ways. Some argue that digitalization or digitization is a technological, social process that relies on applying digital techniques in a broader institutional social form rather than simply converting analog information into digital information. (Hadiono et al., 2021). Westernman (Ricky Oktavenus, 2019) Defines digital transformation as the use of technology to increase a company's performance or reach generally. Another definition is also given by Lankshear and Knobel, where digital transformation is the third and highest level of digital skills achieved when digital use facilitates innovation and creativity and encourages significant changes in the professional field or knowledge. Another fairly common understanding of digital transformation is the change caused or influenced by the use of digital technology in every aspect of human life (Kaplan et al., n.d.; Kaplan & Haenlein, 2010). According to Yoo, Henfridsson, & Lyytinen (Putri et al., 2021) Digital transformation is a change caused by technology at many levels in an organization that includes the exploitation of digital technology to improve existing processes and the exploration of digital innovations, which have the potential to change business models. The digital invention, defined as the recombination of digital technology and physical

components to create new digital products, can be considered potentially threatening to an organization.

2.2. Human Resource Management

Edwin B. Flippo, HRM is the planning, organizing, directing, and controlling of the procurement, development, compensation, integration, maintenance, and termination of employees, to realize the goals of individual companies, employees, and society. HRM is a matter related to the utilization of humans in doing a job to achieve the maximum level of effectiveness and efficiency in realizing the goals to be completed in the company, team members, and also the community. (Susan, 2019). Every organization wants quality and productive human resources in the organization. It takes a process that must be done to get it through the proper recruitment, selection, and placement process so that the organization will get the right resources (Amirudin & Romadhona, 2022). Human Resources (HR)(Molina-Azorin et al., 2021) It is one of the most critical factors that cannot even be separated from an organization in the form of institutions and industrial companies. HR is an integrated ability of individuals' minds and physical power. (Karam et al., 2020; Ling & Jaw, 2011). Thinking power is intelligence brought from birth (talent and creativity), while physical skills are obtained from effort (education and training) (Abbas, 2019). Human resource management is a process that handles various personnel issues in the scope of employees, employees, laborers, managers, and other workers to support the activities of the organization or company to achieve predetermined goals. (Kurniadi, Y U., 2020). To be able to carry out its HR functions in the industrial era 4.0,(Adiawaty, 2019; Hendarsyah, 2019). An HR practitioner must have specific competencies to carry out their functions as an HRM practitioner that prepares human resources to face the development of industry 4.0. An expert in a particular field or practitioner is a leader who carries out his leadership role using his expertise. The natural way to learn leadership is to "do it at work" with practices such as apprenticeship to a skilled artist, craftsman, or practitioner (Adiawaty, 2019).

2.3. Industrial Age 4.0

The emergence of digital technology and the internet marks the start of the industrial revolution 3.0 with the presence of the internet where space and time are increasingly compressed and increasingly culminated in the revolution stage 3.0, namely the digital revolution. In these industry-changing patterns of cooperation and communication in contemporary society (Aysa, 2021). Industry 4.0 is a long stage of industrial development in the world. There are four stages of industrial action. Here are four stages of the industry's evolution from its inception to the present; (a) Late 18th century; The first industrial revolution (1.0) occurred at the end of the 18th century. They are marked by the invention of the first mechanical loom in 1784. At that time, the industry was introduced to automated production facilities using water and steam power. Work equipment that initially depended on human and animal labor was eventually replaced with these machines. Many people are unemployed, but production is believed to have doubled, (b) Early 20th century; The industrial revolution 2.0 occurred at the beginning of the 20th century. At that time, mass production was introduced based on the division of labor. The first production lines involved abattoirs in Cincinnati, United States, in 1870, (c) Early 1970; the early 1970s is considered the first appearance of the industrial revolution 3.0. They are starting with using electronics and information technology to automate production. The debut of the third generation of the industrial revolution was marked by the emergence of the first programmable logic controller (PLC), the 084-969 modem. This computer-based automation system made industrial machines no longer controlled by humans. The impact is that production costs become cheaper, (d) Early 2018; entering 2018 is the era of the industrial revolution 4.0, which is marked by a cyber-physical system. The industrial world has begun to touch the virtual world in the form of human, machine, and data connectivity, all of which are already everywhere. This term is known as the internet of things (IoT) (Yunus & Mitrohardjono, 2020). The characteristics of industrial revolution 4.0 are artificial intelligence, iCloud data, the Internet of people, big data, the Internet of things (IoT), and digitalization. All these new developments have disrupted various fields of human life, including one that is quite The most significant impact is the education sector. Industrial revolution 4.0 is governed by artificial intelligence and digital, physical frameworks that make human-machine relationships more common (Dito & Pujiastuti, 2021).

3. Methods

The writing of this journal uses a research method by analyzing various literature sources that have been collected to carry out a detailed description analysis that aims to strengthen the analysis of the data obtained through the interview method using question and answer addressed to competent experts in the field of education. Human resources (HR). Thus, it is hoped that the methods mentioned above can be used to develop academic areas of science regarding digital transformation in human resource management in the industrial era 4.0. Sources of data taken in this study are research results and books that are relevant to this research. Furthermore, it can also be used as a source of guidance for the development of science and technology, especially in the scope of learning, to change the way Indonesian people think

so that they can create superior works to meet the interests of society in the 4.0 revolution period.

4. Result and Discussions

4.1. Human Resource Management Innovation in the Industrial Age 4.0

Human Resources (HR) is one of the main determinants determining a country's success in taking advantage of the opportunities of the Industrial Revolution 4.0. The right policies and strategies are needed to prepare Indonesian human resources that are superior, competitive, and able to answer the needs and challenges of Industry 4.0. Industrial Revolution 4.0. has significant opportunities and challenges, especially for the business world. The effect of enormous challenges, mainly due to the wave of scanning and automation, has made the Industrial Revolution 4.0 able to erode long-standing jobs (Sabrina, 2021). In the business world in the industrial era 4.0 as it is now, changes need to be made in all sectors to keep up with all advances, especially in the field of modern technology, because from the role of technology, all information can be easily obtained and accessed by every individual or in this case competitors in global industrial market competition. Thus enabling various changes in the basis of competition due to the opening of all access to information. So there need to be things that are linked between changes in the mindset of human resources with changes in technology/digital modernization to be able to survive on the competition map (Yusuf, 2019).

The creative industry is based on human creativity, so the quality of human resources is an essential factor in supporting the development of the creative sector in the era of industrial revolution 4.0 and the competitiveness of the national creative industry. The limited quantity and quality of qualified human resources, as well as the availability of quality training institutions, are still the main problems for the development of the creative industry in Indonesia (Abbas, 2019). The role of technology in HR Information is vast and helps various HR managers work accurately and precisely, including strategic planning, different decision making, and talent management. HPWP (High-Performance Work Practices) is the management of HRM (Human Resource Management) activities that refer to professionalism. These are all expected to be able to develop human capital effectively and efficiently (Budihardjo, 2019). The fourth industrial revolution or industry 4.0 has penetrated various countries worldwide. The industry that connects machines through the internet system has also begun to echo many people's view that industry 4.0 can improve the quality of human life. On the other hand, this revolution is also distractive to workers. Research Director of the Center of Reform on Economics (CORE) Indonesia Mohammad Faisal said there would be changes in consumer expectations that must be balanced with innovation, product and service improvements, including changes to labor needs. According to him, the government needs strategy and readiness not only from the industrial sector but also from the socio-economic aspect. Because industry 4.0 is a technology-intensive industry that tends to absorb a few workers. Meanwhile, Indonesia needs an industry that can encourage the creation of many workers (Adha et al., 2020). The importance of technology today will result in intense competition and competition in facing the demands of industrial revolution 4.0. Therefore, the abilities and skills possessed will result in superior performance and HR achievement (Azharuddin et al., 2020). In creating innovative and adaptive resources to technology, it is necessary to adjust facilities and infrastructure in terms of information technology, the internet, extensive data analysis, and computerization. Universities that provide learning infrastructure are expected to be able to produce graduates who are skilled in aspects of data literacy, technological literacy, and human literacy. Breakthrough innovation will lead to an increase in industrial productivity and has the potential also to give birth to technology-based startups (Utomo et al., 2020).

Various benefits of digitization in HR management; (a) reduce paper use (going paperless). The use of e-mail and Microsoft Office further simplifies the HR management process, which reduces the use of paper and other printed materials; (b) use of team member self-service applications. Using mobile applications in HR management makes the HR management process more accessible and increases team member interaction and the organization. HR applications assist employees in obtaining information quickly and up to date and make it easier to access multiple HR services; (c) automation in motion. Automation reduces working hours compared to manual. Using various digital forms and worksheets with formulas that the company has provided will significantly assist employees in filling out these forms instead of making them manually. Besides reducing working time, it can also reduce the occurrence of errors caused by human error. Adopting technology into HR workflows frees professionals from a lot of routine work. Process automation eliminates paperwork, speeds up multi-tasking, and contributes to more efficient HR performance; (d) recruitment or procurement of employees through social media (recruiting through corporate's website or social media); (e) virtual seminars, socialization, induction, workshop, training. The use of Virtual Reality (VR) technology makes it easier for the HR department to organize meetings, socialization of regulations, induction for new employees (installation or orientation for new employees), workshops, and training (training) more effectively and efficiently than conventionally. In addition to saving time and costs, it can also expand the reach of participants; (f) utilizing the game

method at work (gamification at work); (g) team member analytics. The use of digital technology makes it easier for companies to measure, evaluate and monitor team member performance and behavior in line with company goals; (h) improving management and (i) digitizing this HR, providing all information on team member succession planning, overall performance evaluation and individual potential review including detailed team member profiles.

4.2. Implications of Digital Transformation in the Development of Human Resource Management in the Industrial Age 4.0

In industrial era 4.0, an HR practitioner must have specific competencies to carry out their functions as an HRM institution that prepares human resources to face the development of industry 4.0. An expert in a particular field or practitioner is a leader who carries out a leadership role using his expertise. The natural way to study leadership is to "do it on the job" with practices such as apprenticeship to a skilled artist, craftsman, or practitioner, Adair (2007). So it can be interpreted that a practitioner will carry out his abilities as a leader (Adiawaty, 2019). The existence of this 4.0 industrial revolution era has transformed various sectors into more practical and complex ones through automated and digitized technology. Another opinion also said that technology is a crucial element in the process towards Education 4.0, for that the quality of Human Resources (HR) is an essential and central capital for Indonesia to enter the era of the digital economy. Therefore, human resources are the most critical asset in an organization on a large or small scale because it is a driving factor in maintaining and developing the organization from time to time (Safri, 2016). The characteristics of the 4.0 industrial revolution include being digital, optimal and product demand, automatic, and adapting instruments and work tools with humans. In addition, service and business products, automated data exchange and communication, and digital-based scientific methods are usability (Dwina Kuswadani, Dhami Johar Damiri, 2020). Human resource management can also be described as the utilization of human resources in the organization, which is carried out through human resource planning, human resource development, recruitment, career planning and development, compensation and welfare, occupational safety, and health and industrial relations (Utami & Kusumawati, 2021). Digital transformation has a very significant impact on Human Resources in supporting the improvement of information and changes in digital systems in the management of organizational management.

5. Conclusions

Digital transformation significantly affects HR activities and changes the role of human resource management from static to dynamic and strategic. There are many challenges and opportunities for HR managers to increase team member productivity and ultimately profitability by effectively connecting digital employees with automated work and new digital forms and organizational structures. Several fundamental aspects must be considered in the 4.0 industrial revolution in the digitalization era, including; quality, quantity, and distribution of superior quality human resource management and the necessary capabilities to compete through the labor market in the digitalization era. Therefore, in the 4.0 industrial revolution, human resource management must master science and have skills, values, and behavior related to performance through the ability to think and act in their respective work professions in the digital transformation era.

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