



The Influence Of The Era Of Industrial Revolution 4.0 On Human Resource Competencies

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Abstract: The Fourth Industrial Revolution, characterized by advanced technologies such as IoT, AI, and automation, has brought significant changes to industries, particularly in terms of the competencies required for human resources (HR). Literature reviews reveal that while technology enhances efficiency and productivity, human resources' readiness remains a major challenge. This study uses a literature review method to analyze the changing competency needs of human resources. The findings highlight the importance of continuous training investment to enhance both technical and non-technical skills, ensuring competitiveness in the digital era.

Keywords: Industrial Revolution 4.0, competence, human resources.

INTRODUCTION

The Industrial Revolution 4.0, marked by the integration of digital technology, the Internet of Things (IoT), artificial intelligence (AI), and automation, has significantly transformed various industrial sectors. These changes not only affect production and operational processes but also demand the enhancement of human resource competencies to quickly adapt to new technologies.

In this context, HR competence becomes a crucial factor in determining an organization's success in facing the challenges and opportunities presented by the Fourth Industrial Revolution. Required competencies include technical skills for operating and maintaining new technologies, as well as non-technical skills such as problem-solving, creativity, and collaboration.

The Industrial Revolution 4.0 brings numerous significant changes, especially in the utilization of technology. Companies that previously required many employees are now turning to technological machines to simplify and expedite production processes. Advanced technology not only makes processes more effective and

efficient but also has negative impacts, such as increasing unemployment, environmental damage due to industrial exploitation, and the rapid spread of information. Daily life sees an increasing use of digital technology—from digital computers, digital games, currency digitization (e-money), digital media (e-media), to the rapid development of digital-based films. The digital phenomena developing in global cities can be analyzed through the philosophical lens of Edmund Husserl's phenomenology.

However, it is important to remember that the Fourth Industrial Revolution also requires human resources capable of mastering technology, adapting to changes, and continuously learning and collaborating. Therefore, developing human resources is crucial to ensure that technology is used wisely and sustainably.

This study aims to examine the impact of the Fourth Industrial Revolution on HR competencies across various industrial sectors. The main focus is to understand how new technologies are changing competency needs and how organizations can develop effective training and development strategies to enhance their HR competencies.

Case studies from several companies in Indonesia show that implementing Industry 4.0 technology has increased efficiency and productivity but also presents challenges in HR readiness. Therefore, it is essential for companies to invest in developing HR competencies to maximize the benefits of Industry 4.0 technology and remain competitive in the global market. State your Grand theory which became the basic theory of the Agency theory (Jensen and Mackling 1976). Middle theory: Assymetri Information theory (Akerlof 1970). Applied theory: Is Signalling theory (Ross 1977). Agency Theory was introduced by Jensen and Meckling (1976) in Sugiyanto and Etty (2018) etc.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The 4.0 Industrial Revolution

The Fourth Industrial Revolution (Industry 4.0) has greatly impacted various aspects of human resource (HR) competencies, including technical and non-technical skills. Some studies suggest that new technologies can increase efficiency and productivity, but they also present challenges related to HR readiness. Based on a literature review, the hypothesis developed is that "Industry 4.0 positively influences the enhancement of both technical and non-technical HR competencies."

In the 21st century, the world has entered the digital era known as "Industry 4.0," characterized by the continuous development and upgrading of highly sophisticated digital technologies. During this era, humans are provided with advanced digital technologies and automation, such as robots, artificial intelligence (AI), and the Internet of Things (IoT), to facilitate daily life.

The concept of Industry 4.0 was first introduced by Professor Klaus Schwab, a renowned German economist and founder of the World Economic Forum (WEF). In his book, "The Fourth Industrial Revolution," Schwab states that Industry 4.0 fundamentally changes how we live, work, and interact.

According to Rohida (2018), HR in the Industry 4.0 era needs to enhance their competencies in utilizing digital technologies such as big data, IoT, robots, and AI. Programs aimed at improving these skills are crucial for HR to adapt to the ever-evolving industrial demands. Hardjosoendarmo's research, as cited in Bendriyanti

(2015), indicates that HR in Industry 4.0 must operate swiftly and effectively, aligned with the organization's vision and mission. They need to be proactive in meeting customer needs and continuously striving to increase competitiveness. Leaders in organizations play a vital role in encouraging employees to constantly update their knowledge and skills, ensuring they remain current and relevant to their tasks. This approach includes integrated planning, effective implementation, and decentralized control, all aimed at achieving competitive advantage in a continuously changing environment.

Competence

The term "Competence" in English is known as "Competencies" or "Competence." According to Wojowarsito and Poerwadaminta (1990), competence is defined as ability or aptitude. Powell (1997) explains that competence encompasses skills, authority, and aptitude.

Competence plays a key role in achieving high standards of service quality. It can be improved through systematic and structured education and training processes. Prayitno (2014) identifies three main aspects of competence: knowledge, skills, and attitudes, all crucial for delivering optimal organizational performance.

Human Resources

Jeffrey Pfeffer, as quoted in Sutrisno (2010), states that Human Resources (HR) are the main element that can provide a competitive advantage to face various challenges. For an organization to survive and compete, technological dominance alone is not enough without the support of superior HR. Reliable HR to drive other resources in achieving competitive advantage are those who are proactive, always eager to learn, work hard with high enthusiasm, and are able to work together.

Organizations need HR who can quickly master technology, are adaptive, responsive to technological changes, and have a service-oriented attitude and high integrity. HR always plays an active and dominant role in every organizational activity, as they are the planners, actors, and determinants in achieving organizational goals. Without the active role of HR, organizational goals will not be achieved, even if the organization has sophisticated equipment. Such sophisticated equipment will be useless if HR is not actively involved.

Managing HR is a difficult and complex task because they bring thoughts, feelings, status, desires, and diverse backgrounds into the organization. Therefore, HR cannot be fully regulated like machines, capital, buildings, or other physical equipment. HR must be managed using management theories that focus on the human role in achieving optimal goals.

HR is a key element in achieving competitive advantage. According to Barney in Handoko (Usmara, 2007), HR can be considered to have a competitive advantage if they are seen as highly valuable, especially in their ability to exploit opportunities or overcome threats from the company's environment. HR is the only resource that has potential, intelligence, feelings, desires, skills, knowledge, motivation, strength, and ratio that match the needs of the organization. All these HR potentials greatly influence the organization's efforts in achieving its goals.

Without competent HR, it is difficult for an organization to achieve its goals, even if technology, information, capital, and materials are adequate. Professional HR

management is expected to make employees work productively. This HR management must start from HR planning, job analysis, recruitment, selection, orientation, placement, education and training, HR development, maintenance, to termination. HR are employees who are ready, capable, and alert in providing energy, intelligence, creativity, thoughts, and imagination to support the achievement of organizational goals. Schuller in Sutrisno (2010) defines HR as a recognition of the importance of the workforce in the organization, which is crucial in achieving organizational goals. Schuller also emphasizes the importance of using various functions and activities to ensure that HR is used effectively and fairly for the benefit of individuals, organizations, and society. Every organization certainly expects its HR to be reliable and contribute to the achievement of the organization's vision and mission. Therefore, every organization always expects HR to have various reliable potentials.

METHODS

This research employs a literature review method by collecting and analyzing various relevant sources, including scientific journals, books, research reports, and other articles. The collected data is analyzed to identify trends and key findings related to the changes in competencies required by Human Resources (HR) in the era of the Industrial Revolution 4.0.

RESULT AND DISCUSSION

Research conducted by Izzah in Aliah (2022) indicates that the Fourth Industrial Revolution (Industry 4.0) occurred very quickly with the use of digital machines and the internet. Employees are required to perform various tasks with this smart technology, which functions to enhance human resources (HR). Artificial intelligence (AI) developed can help humans train, hone, and sharpen their skills. This research uses a qualitative descriptive method and aims to understand the strengths of AI in improving HR.

Furthermore, research by Rohida (2018) titled "The Influence of the Industry 4.0 Era on Human Resource Competence" shows that industries require HR to have competencies in utilizing digital technology. These competencies are necessary to realize smart factories by providing opportunities for individuals with skills that match current technological developments. This research uses a participatory qualitative method and collects data through literature studies. The effort aims to prepare and map HR competencies in the Industry 4.0 era to create competent HR that meets industry needs.

The literature review results indicate that the implementation of Industry 4.0 technology has increased efficiency and productivity in various industrial sectors. However, significant challenges exist regarding HR readiness, particularly in mastering new technologies and developing non-technical skills such as problem-solving, creativity, and collaboration. This discussion emphasizes the importance of investing in HR competency development to maximize the benefits of Industry 4.0 technology.

CONCLUSIONS

The Fourth Industrial Revolution (Industry 4.0) has a significant impact on HR competencies, both in terms of enhancing technical and non-technical skills. To

address these challenges, governments and companies need to collaborate and invest in training and HR development, ensuring quick adaptation to technological changes and maintaining competitiveness in the global market.

Competence plays a crucial role in developing highly competitive Human Resources (HR) in the era of Industry 4.0. HR must continuously strive to enhance their knowledge, skills, and attitudes to excel in contributing to the organization's vision and mission. With strong competencies, HR can quickly adapt to technological changes, increase productivity, and provide excellent services. Therefore, investing in ongoing education and training is vital to ensure that HR remains relevant and capable of competing in this dynamic environment.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to all those who have contributed to the completion of this research. I also extend my heartfelt thanks to my colleagues who have participated in the completion of this research. Their discussions and suggestions have greatly enriched this study. Their camaraderie and collaboration have made this journey unforgettable.

Special thanks to my family and friends for their unwavering support and understanding during this period. Their encouragement and belief in my abilities have been a source of strength. Lastly, I acknowledge the use of Google Scholar and Mendeley for reference management, which has been invaluable in organizing and citing the numerous sources referenced in this study.

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