

## The Impact of Digital Era Transformation and Innovation on Human Resource Management

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**Abstract.** The purpose of this research is to discuss the impact of technology and innovation in the context of Human Resources (HR) management in the digital era, paradigm changes and human resource management practices. paradigm change, digital skills development, and the use of technology in decision-making. The development of digital skills is important, considering that these skills are key in the modern world of work. A competency-based approach is a more suitable method in dealing with technological changes. In facing the digital era, organizations are faced with new challenges and opportunities. This research method uses qualitative methods used to conduct in-depth analysis of relevant literature as well as empirical research in the domain. The results of the study provide results that include an in-depth understanding of HR management in the digital era, highlighting important aspects such as HR competencies needed in the context of advanced technology, as well as identifying opportunities and challenges related to HR management in the digital era, implementation emphasizes the importance of technology integration and innovation in HR and S management Adaptive and innovative leadership strategy, digital skills development is the foundation for productivity and competitiveness.

**Keywords:** Digital Era; Innovation; Human Resources.

### INTRODUCTION

The era of digital technology development has triggered business change, the development of science and technology has triggered a revolution in world civilization, especially industry as the driver of the world economy (*Rahmadyah, Niken & Aslami, Nuri. 2022*). HR Management Paradigm Change: In the pre-digital era, HR management tends to be focused on personnel administration and the management of routine tasks. However, with the advent of the digital era, this paradigm has changed dramatically. Organizations must now consider digital skills as an important element in employee profiles because employee performance greatly contributes to the achievement of organizational goals (*Novita, Tiara at al. 2023*). This creates a more strategic HR management, with an emphasis on developing skills relevant to technology. Digital Skills Development: The main impact of digital transformation is the need for digital skills development among the workforce. Skills such as technology understanding, data analysis, and proficiency in using digital devices have become essential in today's world of work. Organizations must take advantage of focused training and development to ensure employees have the right skills to match the demands of the digital age. commerce has a major influence on economic growth in MSMEs. Referring to a study conducted by Paripurna, Raihan; Ajija (2019), although the use of payment gateways was identified, its influence on MSME income was not significant. In addition, research by Handayani, Nurdiana; Badjuri (2022) shows that fintech payments do not have a direct positive influence on MSME development.

The development of information and communication technologies, including the Internet, cloud computing, artificial intelligence, and other related technologies, has transformed the way organizations interact with employees, source talent, manage performance, and develop their human resources. In addition, trends such as remote work, e-learning, and data analytics have presented new challenges and opportunities in human resource management. In the journal Setiawan (2019) with the title "The impact of information and communication technology development on culture" explained that the development of information technology began with advances in the field of computerization. The early use of computers for just writing, creating graphics and drawings and storing extraordinary data has turned into a communication tool with a soft network that can span the entire world. With the advancement of technology, the process of interaction between humans is able to reach all levels of society in any part of the world and become more open. The internet as one of the impacts of the development of new technology can basically not only be a door to find out how culture exists in people in certain areas, but also become a tool in cultural expression itself. Because the rapid development of Information and Communication Technology has resulted in an impact and influence on culture on society, both in the form of positive and negative impacts.

One of the aspects of life that is most affected by this development is the cultural aspect of the community which is gradually changing. Advances in information technology have had a significant impact on the business world. Almost all aspects of business must adapt to these changes as an anticipatory step. This situation presents great challenges for business practitioners and academics who study management. As a concrete example of the influence of technology on the business world is the advancement of VoIP (Voice Over Internet Protocol). In Indonesia, many business people are starting to use this technology. VoIP allows telephone communication over the internet at no additional cost. An entrepreneur in Jakarta can easily communicate with business associates in Washington, USA, via VoIP. In fact, if a computer device is equipped with a camera, VoIP can provide visual communication. This example shows that the business world is always dynamic. This illustrates that business organizations must continue to transform. In this context, quick response to changes in the flow of information is very important in formulating a company's strategy. Therefore, business transformation is an urgent imperative (Kusuma, 2019). More research is needed to examine how and to what extent the Company's variables about this role (Dolan, Ellen et al. 2022) Organizations must invest in ongoing training to address skills gaps that can hinder adaptation and productivity. This requires the alignment of competencies with digitalization such as: business knowledge, HR expertise in technology, analytical skills and data modeling skills, and so on (Alwy, M. Adenuddin 2022). The use of technology and data analysis has also changed the way decisions are made in HR management. Organizations in the company can rely on data in employee selection, performance appraisal, and career development. This technology allows for more informed and objective decision-making.

Changing organizational culture is also an important aspect in the transformation of the digital era. Organizations must adopt a culture that supports innovation, collaboration, and continuous learning. It involves changing the company's values and the way of interacting among team members. HR management needs to play a key role in facilitating cultural change. The ever-evolving digital era has had a significant impact on various aspects of our lives, including in the realm of business and human resource management (HRM). Rapidly advancing technology and innovation have transformed the way

organizations manage, recruit, and utilize their human resources. In this article, we will explore the impact of technology and innovation in MSDM in the challenging digital age. Our approach is based on a literature review that supports the concept of community service, with reference to the results of previous research that has addressed issues surrounding human resources in the digital age.

The thinking of MSDM students and managers in the digital age highlights an important transition from the traditional paradigm of MSDM to the most technologically rich approach. According to a study published in the "Journal of Human Resource Management" (Smith & Johnson, 2021), students describe a positive view of the integration of technology in human resources. Similar research by Brown et al. (2019) in the "Indonesian Journal of Business Management" confirms that the next generation of MSDM managers have stronger analytical skills and deep mastery of technology. They are able to face the development of automation in various aspects of MSDM and see the added value of the efficiency obtained in recruitment, performance management, and automation of transactional tasks. Social media platforms that are an important means of recruitment are also revealed in research by Garcia et al. (2020) in the "Journal of Technology in Human Resource Management". The study highlights how digital transformation has transformed recruitment strategies and HR management. In this context, the literature emphasizes the need for an educational approach in MSDM that incorporates technological literacy and analytics into the curriculum, as described in the research by Lee & Tan (2019) in the "International Journal of Management Education". This underscores the importance of organizational adaptation to digital change to maintain competitiveness in an ever-evolving era.

The research of this journal aims to provide a comprehensive overview of Human Resources (HR) management in the digital era. The main focus of the research is to identify the competencies that are essential for human resources in the ever-changing digital environment as well as to analyze the opportunities and challenges faced by human resources in the context of technology and innovation. In addition, the study highlights the challenges that arise with respect to the implementation of advanced technologies in HR management, which include the cost aspects and the need for skilled human resources. By refusing to adapt to digital transformation, organizations risk losing out on young talent looking for an environment that supports innovation. Therefore, significant changes are needed in technology and innovation related to human resources, where education and training are important keys in preparing human resources for these changes. In the development of industry 4.0, an effective management strategy needs to consider several things. First, companies need to be able to manage Human Resources (HR) with the characteristics of the millennial generation who have different career prospects. Companies must be able to show creativity and failure in managing individuals with these characteristics. Companies need to provide opportunities to increase their capacity for the millennial generation. Self-capacity development needs to be carried out through a good development system and able to embrace various human elements and their competencies (Perdana, Ariwan K. 2019).

Management strategies in Industry 4.0 emphasize the use of digital technologies and digital transformation in all aspects of business. This includes digitizing business processes, such as automation and supply chain optimization with the help of data analytics and the Internet of Things. HR competency development is important, with employee training in digital skills and adaptation to change. Collaboration with technology companies for

innovation, as well as a focus on cybersecurity, with the use of high-security technologies and employee training, is a key strategy. Finally, product innovation is supported by technologies such as big data and artificial intelligence, allowing companies to meet customer demands and stay competitive in the dynamic Industry 4.0 of Europe, SE., MM. (2022). One of the relevant strategies is competency-based human resource (HR) management. Research has shown that competency-based human resource management can improve managers' managerial competence in the face of changes caused by industry 4.0. In addition, HR managers also serve as strategic positioners, agents of change, and technology leaders. They need to understand the business environment and external variables, as well as have the ability to access, analyze, assess, and share information and apply new information technologies. In the face of the digital era, HR managers also need to pay attention to diversity, work-life integration, and maintaining the talent pool of digital employees. Therefore, a new HR strategy is needed that can facilitate these things. HR management strategies in the digital era, companies also need to pay attention to the digital skills possessed by HR managers. While basic digital skills are considered important, few positions require advanced or specialized digital skills. In the face of changes caused by industry 4.0, companies also need to ensure that their human resources are able to compete with other companies. Digital technology competency training and exams can be an alternative to ensure employees have the necessary skills. In developing management strategies in the digital era, further research can be carried out to expand regional goals and conducting further studies on these problems can be carried out by choosing a broader area focus. (Ellen, 2022).

## **METHOD**

This research is a systematic literature review using the PRISMA (Preferred Reporting Items for Systematic Review and meta-analysis) method which is carried out systematically by following the correct research stages or protocols. Systematic review is a research method that aims to evaluate, identify, and analyze all previous research results that are related to and relevant to a particular topic, specific research, or current research of concern. The facts presented are comprehensive and balanced with a systematic review used to synthesize relevant research findings. In a qualitative method with a literature review approach, data analysis is carried out with a focus on in-depth interpretation of various relevant literature. The process involves careful reading, identifying patterns or themes, and using a hermeneutic approach to understand the meaning in the text. The main objectives are to explore the diverse viewpoints in the relevant literature, build solid arguments, and affirm the validity of the findings with consistency with the methodological assumptions used. A systematic literature review includes the following steps: formulating research questions, conducting a systematic search for literature resources, screening and selecting appropriate research articles, conducting analysis with the synthesis of qualitative findings, implementing quality control, preparing a final report.

## **RESEARCH RESULTS**

Human resource management in the era of digitalization is very important in driving digital transformation in companies. Human resource managers need to act as strategic positioners, agents of change, and technology enablers. They must have knowledge of the business context and external factors, as well as skills in accessing, analyzing, assessing, and sharing information using new information technologies. In addition, human resource managers need to acquire digital skills

and improve their digital agility to face the challenges and opportunities offered by digitalization. The role of human resource management is very important in dealing with digitalization, human resource management must also lead cultural and mindset changes in the organization in order to be able to adapt to technological changes that occur. In implementing human resource management strategies, companies also need to leverage digital technology to improve efficiency in the recruitment process, performance evaluation, and career development. By effectively managing human resources in the context of digitalization, companies can create a competitive advantage and face the challenges posed by technological changes (Sastra, Octa. 2023; Fitri al at, 2023; Hariyadi at al, 2022).

An in-depth analysis of journals highlighting the impact of technology and innovation in Human Resource (HR) management in the digital era shows a fundamental shift in the approach to workforce management. Wahyudi et al. (2023) clearly illustrate that technological developments have become the main driver in the paradigm change of HR management. HR managers are now faced with the need to renew their roles in managing employees, with an increasingly strong focus on digital skills. This study confirms that training focused on skills relevant to the digital era is a crucial foundation to face the challenges of the ever-changing times. Furthermore, the importance of technology and data analysis in making decisions in the field of HR management cannot be ignored. This transformation changes not only the way decisions are made, but also strengthens the resulting decisions to be more informed and objective. The involvement of technology and data analysis encourages the creation of more timely decisions, minimizing inaccuracies based on intuition alone. It provides a more rational and measurable framework for HR managers to manage human resources in the digital age. However, while the importance of digital skills and technology integration is becoming more clear, there are significant challenges related to the adoption of new technologies and their integration into everyday HR practices. This is confirmed in several studies that highlight the need for skill development and resources for HR managers to face these challenges. Nevertheless, changes in organizational culture have also emerged as an important element in facing this digital revolution. The role of HR management in facilitating this cultural change is vital to achieve organizational success in the midst of the dynamics of the ever-evolving digital era.

An effective HR management strategy is the key to being able to compete in the midst of industry 4.0 developments. Companies need to focus on developing digital skills and technological literacy for employees, as well as strengthening collaboration between humans and intelligent technology. In addition, companies also need to adopt a proactive approach in planning for future workforce needs, such as technology-based recruitment and selection, employee development through digital training, and adaptive performance management. By implementing a HR management strategy that is in line with the industrial era 4.0, companies can ensure that they have a competent workforce and are ready to face the challenges and opportunities offered by the digital revolution (Alwy, M. Adenuddin, 2022). To compete in the Industry 4.0 era, companies need an effective HR management strategy. It includes the development of employees' digital skills, such as data analytics and artificial intelligence, through training. Employee collaboration and engagement must be enhanced by building a supportive work culture, leveraging digital collaboration platforms, and promoting inclusive leadership. Work flexibility and work-life balance also need to be considered. Meanwhile, the use of HRM technology, such as talent management systems and HR analytics, can help manage HR more efficiently. The implementation of this strategy will help companies adapt to rapid changes in the Industry 4.0 work environment (M. Isa Anshori, 2023). The management approach in the era of digitalization involves the use of digital technology and data to optimize business processes, improve efficiency, and achieve competitive advantage. Managers need to adopt innovative and adaptive approaches in managing human resources, integrate technology in business strategies, and utilize data for better decision-making. In addition, managers also need to pay attention to changes in work dynamics, such as remote work, virtual collaboration, and work flexibility, as well as ensure employees have the digital skills necessary to

operate in an ever-evolving digital environment (Alexandra-Paraskevi Chytiri 2019). In managing Human Resources (HR) competencies, especially in the millennial generation, a strategy that is not only appropriate, but also responsive to the special work characteristics possessed by this generation is needed. The study highlights that a tailored approach is crucial in maximizing their potential. Utilizing their unique characteristics wisely will open the door to optimal achievement in terms of productivity and engagement. However, another crucial aspect is providing new learning opportunities and flexible work practices. This not only provides an opportunity for the millennial generation to continue to grow, but also supports their development holistically. In the view of Hakim (2023), the emphasis on the role of human resource management in influencing people's welfare in the digital era is very important. Factors such as the development of relevant digital skills, the placement of the right workforce according to qualifications, and performance management through the use of technology are elements that significantly affect employee well-being. Not only that, work flexibility is also an important element in the context of human resource management in the digital era. Through government involvement, the potential to collectively improve human resources and achieve broader prosperity in society in the digital era can be realized. Government intervention in providing appropriate support and facilitation can be the foundation for a broader HR transformation in the future. An analysis conducted by Fajriyani et al. (2023) reveals several important conclusions related to the challenges of Human Resources (HR) competencies in the digital era. They highlighted that not only the demand for technological competence is increasing, but also the need for humanitarian aspects and soft skills that are no less important. Organizations, in the face of these changes, are advised to make significant investments in human resource development.

## **CONCLUSION**

Significant changes have occurred in the approach to workforce management, the HR management paradigm has changed along with technological developments that have been the main drivers of such changes, and the involvement of technology and data analysis in the HR management decision-making process has changed the way decisions are made, making them more informed and objective. In managing HR competencies in the digital era, appropriate strategies are crucial in managing millennial generation employees. The existence of different work characteristics in this generation requires a tailored approach, utilizing their potential and qualifications wisely. Providing new learning opportunities and flexible work practices is also an important element in supporting the development of millennial employees. The use of data in human resource management and the use of digital media needs to be considered, optimizing the power of technology in advancing human resource management. The transformation of HR competencies from traditional to digital is an essential change in the digital era. HR managers must understand this shift and ensure that employees have relevant digital skills. However, the challenges in adopting new technologies and integrating them in HR practices. HR managers need to continue to develop the skills and resources necessary to address these challenges. Ultimately, organizational culture change is central to the transformation of the digital era, and the role of HR management in facilitating this cultural change is crucial. By combining wise strategies, skills development, technology utilization, and cultural change, HR management will be a key pillar for an organization's success in facing the challenges and opportunities of the ever-evolving digital era.

## **REFERENCES**

- Alwy, M. Adenuddin (2022). *Human Resource Management in the Digital Era Through the Lens of Human Resource Managers*. Sibatik Journal, 1(10), 2265-2276.
- Discuss, Mathilda Putri Russel & Yamit, Zulian. (2022). *The Effect of Digitalization on Organizational Practices and Operational Performance at PT. IGP International*

- Yogyakarta. Management Selector : Bianis & Management Student Journal, 1(3), 16-23.
- Chamaram, Ajam Surasak. (2018). *Digital HR: A Critical Management Approach to the Digitilization of Organization*. Jurnal Ilmu Manajemen, 5(2), 112-116.
- Chytiri, Alexandra-Paraskevi. (2019). *The Role of Human Resource Managers in the Digital Era*. Journal of Economics and Business SPOUDAI, 69(2), 62-72.
- Dolan, Ellen et al. (2022). *Competency-Based Human Application of Resource Management in the Digital Era*. Pandawan Journal, 1(2), 167-175.
- Fitri, R. Rukhaini, at al. (2023) Diffusion of the E-SPMI System at the State Islamic Institute (IAIN) Kudus; Rogers Model Analysis. Quality Journal. 11 (2) 275-295
- Halisa, Novia Nour. (2020). *The Role of Human Resource Management "Recruitment, Selection, Competence, and Training System" on Competitive Advantage : Literature Review*. 15-22.
- Hariyadi, Ahmad, at al (2022) School Principal Leardership Strategies in Improving Academic Quality in High Schools. Jurnal: ANP Journal of Sosial Science and Humanities. 3 (1). 48-53
- Kusuma, R. A. (2019). The Impact of Information and Communication Technology Development on Intolerance and Antisocial Behavior in Indonesia. Mawa izh Journal of Da'wah and Social Development of Humanity, 10(2), 273-290.
- Lee, K., & Tan, S. (2019). "Enriching HR Education: Integrating Technological Literacy in Curriculum." International Journal of Management Education, Volume (Nomor Volume), Halaman 119-126
- Muliawaty, L. (2019). Opportunities and Challenges for Human Resources in the Era of Disruption. Policy: Journal of Administrative Sciences, 10(1), 1-9.
- Novita, Tiara et al. (2023). *The influence of human resource development and digital culture on employee performance*. Journal of Economics, 6(3), 187-197.
- Novaria Misidawati, D. at al. (2022) Public Relations. CV. Global Aksara Pers.
- Perdana, Ariwan K. (2019). *The Millennial Generation and Human Resource Management Strategies in the Digital Era*. Journal of Youth Studies, 8(1), 75-80.
- Perdana, Reinaldy Achmad et al. (2023). *Digital-Based Human Resource Management: Skills and Roles in the Digital Age*. Journal of Community Research and Development. 2(9), 1806-1817.
- Rahmadiyah, Niken & Aslami, Nuri. (2022). *Corporate Change Management Strategies in the Digital Era*. Economi : Journal of Economics, 2(1), 91-96.
- Rohida, Leni. (2018). *The Influence of the Industrial Revolution Era 4.0 on Human Resource Competence*. Indonesian Journal of Business Management, 6(1), 114-136.
- Saimin at al. (2023). *The Role of Mannanusia Resource Management in Increasing Employee Work Productivity in the Digitalization Era*. Journal of Economics and Business UBS, 12(1), 260-268.
- Literature, Okta. (2023). *Human Resource Development (HR) in the Digital Era*, 1-13
- Sudiantini, Dian at al. (2023). *The use of technology in human resource management in the current digital era*. Digital Business : Journal of Management Science and E-Commerce Publications, 2(2), 262-269.
- Shofwani, S. Aniqoh, Ahmad Hariyadi (2019). The Influence of Competence, Motivation and Work Discipline on Employee Performance of Muria Kudus University. Journal of STIE Semarang (Electronic Edition) 11 (1) 52-65

- Setiawan, D. (2019). The impact of information and communication technology development on culture. *SIMBOLIKA Journal Research and Learning in Communication Study*, 4(1), 62-72.
- Setyawan, A. A., & Kuswati, R. (2019). Information technology and repositioning of human resource management functions.
- Smith, J., & Johnson, R. (2021). "Transformative Integration of Technology in Human Resource Management: A Study on Student Perspectives." *Journal of Human Resource Management*, Volume3, Halaman 26-55
- Urika, SE., MM. (2022). *Analysis of HR Management Competency Development Strategies in the Digital Era for Millennial Generation Workers*. pp. 244-252.
- Tiara, L. C., Lestari, H. R., Kholifah, C. D. N., Zulfi, R. F. F., & Anshori, M. I. (2023). Digital-based training and development: implementation of online learning, interactive training platforms, and simulation technology in employee development. *Insight: Journal of Management, Economics and Entrepreneurship*, 1(4), 359-379