

Transformation And Management Strategy Human Resources : Managing Adaptation Employees And Development Skills In The Industrial Era 4.0

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Article Info

Keywords:

Digital Transformation,
HR Management Strategy,
Industry 4.0.

ABSTRACT

Digital transformation in the Industry 4.0 era brings major challenges for organizations, especially in managing human resources (HR) who must adapt to new technologies. This study aims to explore HR strategies that can support the digital transformation process in Indonesian organizations, with a focus on managing employee adaptation and developing skills to face rapid technological changes. This study uses a descriptive qualitative approach through a literature study, which collect information from various references related to previous theories and research. The results of the study indicates that the success of digital transformation is highly dependent on an integrated and adaptive HR strategy. Organizations need to manage resistance to technological change by providing skills training (upskilling) and reskilling), creating a supportive work environment, and strengthening employees ' technical and non- technical skills. In addition, transparent communication and inclusive leadership is essential to facilitate the employee adaptation process. This study concludes that with proper HR management, organizations can create a workforce that is ready to face challenges in the digital era and ensure business sustainability in the future.

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INTRODUCTION

Source Power human become the most important factor in the process of building as well as achievement the goals that have been set by the company or organization. in company / company.. Source Power man in the form of factor determination succeed or whether or not in achievement objectives (Saputra et al., 2020). Along with the development of industry that has reach 4.0 sources Power man bring various developments that change dynamics work and needs skills with development developing digital technology rapid until Lots popping up development technology like automation, intelligence artificial intelligence, and the Internet of Things (IoT), business processes experience shift significant going to digitalization. This digital transformation push organization For adjust management strategy source Power human (HR) use increase Power competitiveness and sustainability business. Effective HR

strategies now covers effort adaptation employee as well as development appropriate skills with demands technology new (Subiakto & Sarwono, 2021).

Digital transformation brings the main challenge is in manage and adapt employee to change rapid technology. According to Wibowo (2019), the challenges main is gap skills (*skill gap*) and resilience employee in face technology new fast growing. Many employees face difficulty in control digital skills required For supports automation and data analytics processes, which become core components of Industry 4.0. Therefore that, organization expected capable designing relevant training programs, improving digital literacy, and managing the adaptation process For ensure employee can control technology with good and steady productive.

Resistance to change is also an important issue in digital transformation, where some employees feel stressed by changes that require new skills. According to Santoso (2020), the success of digital transformation is highly dependent on the readiness of the organization to overcome resistance through an inclusive and sustainable human resource (HR) strategy. An effective approach includes providing a conducive work environment for learning and adequate support so that employees feel safe in exploring new technologies. A human resource (HR) strategy that focuses on employee adaptation and skill development is key to maintaining the relevance of the workforce in the digital era. Thus, this study aims to explore human resource (HR) strategies that can support the digital transformation process in Indonesian organizations, as well as identify factors that play an important role in improving employee adaptation and skills to be competitive in the Industry 4.0 era. Through proper human resource (HR) management, it is hoped that organizations will be able to utilize technology optimally and build a workforce that is ready to face future challenges. To support the success of digital transformation, organizations need to design a human resource (HR) strategy that focuses not only on improving technical skills, but also on managing changes in organizational culture. According to Prasetyo and Sutopo (2020), effective digital transformation requires a change in mindset, where employees are encouraged to be open to innovation and new technologies. In addition, organizations must be able to provide training and development programs that not only cover technical skills, but also other critical skills such as problem- solving and analytical thinking, which are essential in dealing with technological dynamics.

Continuous digital skills development is needed to address the skills gap between organizational needs and employee capabilities. Rachman (2021) stated that the role of human resources (HR) in the Industry 4.0 era must include the preparation of *upskilling* and *reskilling programs* so that employees can keep up with changing labor market needs. This effort needs to be complemented by a clear evaluation method to ensure that the training provided is effective and sustainable, so that it can produce employees who are able to adapt to technological developments.

Furthermore, an effective human resources (HR) strategy in the Industry 4.0 era must focus on creating a work environment that supports collaboration, innovation, and continuous learning. This conducive environment not only increases employees' adaptability to new

technologies but also encourages active employee involvement in the digital transformation process. Santoso and Pratama (2022) emphasize that successful employee adaptation management requires a transparent approach, open communication, and support from visionary leadership so that employees feel involved and motivated in undergoing change.

Effective human resource (HR) strategies in managing employee adaptation and skills development in the Industry 4.0 era, by highlighting best practices from the literature and experiences in Indonesian organizations. It is hoped that the results of this study can provide guidance for human resource (HR) practitioners in facing increasingly complex digital transformations and creating a workforce that is ready and competitive for the future.

Literature Review

Digital Transformation

Digital transformation is the process of changing from traditional ways of working and doing business to being integrated with digital technology. The Industry 4.0 era is an era in which digital technology and automation are combined to create a more efficient, flexible, and connected production system. This era is marked by the emergence of various new technologies, such as artificial intelligence (AI), *the internet of things (IoT)*, and *the Internet of Things (IoT) things (IoT)*, and big data. Digital transformation involves the evolution of digital technologies that have a major impact on the way businesses and organizations work (in Meliyanti and Ahmad, 2024). Digital technology plays a vital role in improving business efficiency, effectiveness, and performance, helping to facilitate access to information and simplify interactions. The digital era has brought about major changes in HR management. According to Asari et al. (2023), the impact of the digital era on digital transformation includes:

1. The shift from traditional to digital jobs

The digital age has increased the demand for jobs that require digital skills and made some traditional jobs irrelevant. Companies must address this challenge by ensuring that their human resources have the skills and flexibility needed to work in a changing environment.

2. Increased job mobility

The digital era allows human resources to work from anywhere and anytime. This requires companies to ensure that they have the right systems and technologies to manage human resources who are not in the office.

3. Data and analytics

The digital age has made data and analytics more accessible and significantly increased an organization's ability to analyze human resource data. Companies must ensure that they have access to the right data and analytics to help them make informed decisions about their human resources.

The rapid transformation in digital technology has changed the function of humans in the work environment. Various application systems that have emerged have contributed to the increased use of technology. Human resource transformation in the digital era requires

companies to ensure that they have the right strategies and technologies to overcome challenges and take advantage of available opportunities.

Industry 4.0

Industry 4.0, or revolution industry fourth, is stage new in development industry that combines digital technology with system production. According to Schwab (2016), the revolution This involving utilization technology advanced such as the Internet of Things (IoT), intelligence artificial intelligence (AI), robotics, big data, and computing cloud computing for create system more production efficient, flexible, and connected. With adoption technology said, the company can integrate all over chain mark they, start from design products, production processes, to distribution and services finished sell, with a better way smart and responsive to market changes (Kagermann, 2015).

One of consequence main from the application of Industry 4.0 is increasing automation increases, which reduces dependence on power Work man For manual and repetitive tasks. Improvement automation This allow company For increase productivity, reduce errors, and lower cost operational. However, on the other hand, this this also raises challenge for power work, because Lots previous job done by humans now replaced by machines or technology automatic. As example, in sector manufacturing, intelligent robots and systems automatic the more Lots used for production processes that require precision height and speed that is not can achieved by force manual work (Brettel et al., 2014).

Change this also opens opportunity for company For develop more products and services innovative and improving cycle life products, which allow they For respond market demand with more fast and efficient. However, the impact from this digital transformation to power very big job, considering work traditional that requires manual skills start replaced by machines. Therefore that 's important for company For identify need skills new in the future and ensure that employee given relevant training For adapt with development technology that continues changed (Brynjolfsson & McAfee, 2014).

Preparation skills new for employee This become aspect crucial, because changes that occur can create gap skills that influence Power competition company. As response to matter this, many organization that started implementing training programs based on technology For strengthen ability employee in face challenges in the digital era (Chui et al., 2017). Therefore that, company No only need focus on implementation technology new, but also on development and improvement skills employees so that they still relevant and productive in an increasingly working world automated and digital- based.

Human Resources (HR) Strategy

Perdana and Ariwan K (in Wahyudi et al., 2023) explained that an effective management strategy in the development of industry 4.0 needs to consider several aspects. 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 for self-capacity improvement for the millennial generation. Self-capacity development needs to be carried out through a good development system and

is able to embrace various human elements and their competencies. The management strategy in the industrial era 4.0 emphasizes the use of digital technology and digital transformation in all aspects of business.

In Human Resource Management (HRM), HR competency development is important, through employee training for digital skills and adaptation to change. One of the relevant strategies in HRM is competency-based HRM. Rohida (in Tahar Achmad et al., 2022) explains that HR in the industrial era 4.0 must improve their competency in utilizing digital technology such as *big data, internet of things, and technology. things, robots and Artificial Intelligence*. Programs to improve these skills are very important to understand so that human resources are able to adapt to industry demands. In HR management strategies, points that need to be considered in HR strategies include (Tahar Achmad et al., 2022):

1. *Digital Skill for Digital Competency*

Digital competence is the knowledge, skills, attitudes and awareness needed when using information technology. So that Management must seriously improve employee skills training in achieving digital competence.

2. *Implementation of Digital Competency Development*

Good digital skills and digital implementation are a sign of institutional success in implementing digital technology.

3. *Human Value Enhancement*

Human resource development includes developing self-identity, namely fostering a sense of empathy and sympathy, being able to interact/communicate with any social group so as to be able to survive in all dynamics.

Employee Adaptation in Digital Transformation

Adaptation employee to change technology be one of challenge the biggest in the process of digital transformation in the company. Changes fast and immersive technology often causes anxiety, especially for employees who feel No Ready or No Enough skilled For face technology new. According to Anderson and Ackerman Anderson (2019), readiness individual For adapt influenced by several factors, such as motivation, skills, and support provided by the organization. Employees who feel more skilled and confident self in use technology new tend more fast adapt, while those who feel threatened or No own skills required Can show resistance to change (Elrod & Tippett, 2018). In terms of this, adaptation No only related with skills technical, but also includes aspect emotional and psychological from change That Alone.

One of challenge main in facilitate adaptation employee is How manage transition with the way that can reduce anxiety and increase involvement they. McKinsey & Company (2021) revealed that level success adaptation is greatly influenced by the support provided, such as appropriate training and opportunities For Work in project based on technology. Employees who are given chance For involved direct in use technology new in a supportive environment more tend For succeed adapt. Research conducted by Beer et al. (2015) also shows that management effective change, which involves proper training and support social, can increase reception to technology new and reduce resistance among employees. Therefore

that, company need designing appropriate training programs, as well as ensure clear communication about objectives and benefits from changes made.

A comprehensive approach, which includes development skills technical and management aspect psychological employees, very important For facilitate the adaptation process to technology new. Sneeze (2017) explains that company that builds culture learning sustainable and provide support strong managerial during transformation tend more succeed in reduce resistance to change. Approach This focused on creation supportive environment employee in learn and adapt self. Luecke (2018) also emphasized that strong leadership as well as existence clear vision from management is very important For reduce uncertainty and increase involvement employee in the process of change. With give enough time for employee For adapt as well as provide training sustainable, company can ensure more transition smooth in term length. In addition, Caldwell (2017) also highlighted importance transparent communication from management, which can reduce anxiety and increase trust employee towards the ongoing transformation process ongoing.

Employee Skills Development

Development skills employee become key main in face challenges posed by digital transformation. The skills required in the Industry 4.0 era are far different than what was needed in the previous era. For example, skills technical like use device software, programming, and data management today become very crucial. However, non- technical skills also have role important, such as creativity, ability adapt, and intelligence emotional. Although technology the more advanced, interpersonal and strategic skills man still not replaced, which makes skills the the more valuable (Davenport & Westerman, 2018; Brynjolfsson & McAfee, 2019).

According to Bersin (2017), to prepare employee facing an increasingly digital future, companies need identify skills that will needed and ensure that employee get appropriate training. This process Can done through various approaches, such as learning digital based, applied training directly on the spot work, as well as mentorship and coaching programs. One of the current solution Lots applied is use of online training platforms, which allows employee access material learning in accordance with need them and flexibility time (Cappelli, 2020).

With progress increasingly advanced technology rapid, development skills must sustainable. Companies need to create culture supportive learning learning throughout career, which allows employee Keep going renew skills them to stay relevant in the ever-growing job market changing and competitive. A The report by the World Economic Forum (2020) also emphasized that For still compete, company must provide opportunity for employee For Keep going develop and utilize technology latest. Therefore that, a successful company is those who can integrate development skills in long term strategy long they.

RESEARCH METHODS

This research uses a qualitative or descriptive method approach. Where the article This use studies library research. study library (library research) is collection information with method learn theories from various related references with research. According to Zed (2008) there

is four step in study library namely prepare equipment tools needed, preparing a list of references used, organizing duration as well as reading and writing material research. Collecting information by searching for sources and constructing from various sources such as books, journals, and existing research. The analysis method uses content analysis and descriptive analysis. Library materials found from various references are analyzed critically and in depth in order to support infrastructure and responses.

RESULTS AND DISCUSSION

Digital transformation in the Industry 4.0 era presents opportunity at a time significant challenges towards management strategy source Power human resources (HR). Based on study, adaptation employee to technology new be one of challenge main in effort transformation this. In the context of This is an effective HR strategy No only must focus on improvement skills technical, but also management change culture organization, creating environment conducive work, and building pattern think adaptive.

Challenge the biggest in implementation of this strategy is resistance employee to change technology. Some employee feel stressed Because must control technology new fast developing. This is show the need approach more management integrated, including training skills (upskilling) and skills relevant new (reskilling). Additionally, it is required support psychological through communication open and involvement direct in the process of transformation.

Progress technology also demands shift the role of HR, from only operate function administrative become a driving force innovation and collaboration. Successful companies in this era tend apply approach based on digital competencies, such as development ability data analytics, big data utilization, and intelligence artificial intelligence (AI). However, the transformation This need evaluation sustainable For ensure training programs walk effective and productive impact positive. On the other hand, if approach This No done optimally, the company at risk experience increasing skill gap, which ultimately will influence productivity organization in a way overall. Therefore that 's important For build culture learning sustainable and provide support visionary leadership.

CONCLUSION

From the results analysis, can concluded that success Digital transformation in the Industry 4.0 era is highly dependent on an integrated and adaptive HR management strategy. Organizations must capable manage resistance employee to change technology through training relevant skills, creating environment supportive work, as well as strengthen skills technical and non- technical employee. HR strategy based on digital competencies, such as digital skill development, application digital technology in system work, and formation pattern think innovative, become key main For ensure sustainability business in the future. Organizations must also prioritize transparent communication and inclusive leadership For facilitate the adaptation process. Organizations need to prioritize HR development through relevant training programs, such as *upskilling* and *reskilling*, to meet the needs of new

technologies. In addition, companies are advised to create a work culture that supports lifelong learning so that employees can continue to improve their competencies. Support from management, in the form of transparent communication and visionary leadership, is also very important to reduce resistance to change. Furthermore, companies need to integrate periodic evaluations of skills development programs to ensure that the strategies implemented have a positive impact on the organization and employees. With a holistic approach, organizations can build a resilient workforce that is ready to compete in the digital era.

REFERENCES

- Anderson, D., & Ackerman Anderson, L. (2019). *The Change Leader's Roadmap: How to Navigate Your Organization's Transformation*. Wiley.
- Asari Andi dkk. (2023). *Manajemen SDM di Era Transformasi Digital*. Yogyakarta: CV. Istana Agency.
- Bersin, J. (2017). *Reimagining the Workplace: The Future of HR Technology and Learning*. Deloitte Insights.
- Beer, M., Eisenstat, R. A., & Spector, B. (2015). "Why Change Programs Don't Produce Change." *Harvard Business Review*.
- Brettel et, al. (2014). "How virtualization, decentralization and network building change the manufacturing landscape: An Industry 4.0 perspective." *International Journal of Mechanical, Industrial Science and Engineering*, 8(1), 37-44. <https://doi.org/10.5281/zenodo.1336426>
- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W.W. Norton & Company.
- Caldwell, R. (2017). "Resisting change: A multi-level analysis of the organizational and individual dynamics of change resistance." *Journal of Organizational Change Management*, 30(1), 11-30.
- Cappelli, P. (2020). *The New Deal at Work: Managing the Market-Driven Workforce*. Harvard Business Review Press.
- Chui, M., Manyika, J., & Miremadi, M. (2017). "Where machines could replace humans—and where they can't (yet)." *McKinsey Quarterly*. McKinsey & Company.
- Davenport, T. H., & Westerman, G. (2018). *The Future of Work: Robots, AI, and Automation*. Harvard Business Press.
- Elrod, D., & Tippett, D. (2018). "The "Death Valley" of change." *Journal of Organizational Change Management*, 15(3), 273-291.
- Kagermann, H. (2015). "Change through digitization—Value creation in the age of Industry 4.0." *Management of Permanent Change*, 23(4), 1-19.
- Luecke, R. (2018). *Managing Change and Transition*. Harvard Business Press.
- McKinsey & Company. (2021). "The Future of Work in the Digital Age." McKinsey & Company.
- Meliyanti Dea Putri dan Ahmad Gunawan. (2024). Strategi Pengelolaan SDM Dalam Peningkatan Kinerja Perusahaan di Era Industri 4.0. *Jurnal Ekonomi dan Bisnis Digital*. 01(03), 390-395.

- Prasetyo, B., & Sutopo, A. (2020). *Strategi Pengembangan SDM di Era Industri 4.0: Peluang dan Tantangan*. Bandung: Alfabeta.
- Rachman, I. (2021). *Upgrading Kompetensi Karyawan di Era Digital: Pendekatan SDM untuk Keseimbangan Kompetensi*. Surabaya: Penerbit Laksana
- Rahmawati Shinta dkk. (2024). Pentingnya Pengembangan Keterampilan Sumber Daya Manusia Melalui Program Pelatihan di Era Digital. *Gudang Jurnal Multidisiplin Ilmu*. 2(10), 95-99
- Santoso, D. (2020). *Transformasi Digital dan Budaya Organisasi di Era Industri 4.0*. Yogyakarta: Penerbit Andi.
- Santoso, W., & Pratama, R. (2022). *Inovasi SDM dan Transformasi Digital di Organisasi: Pendekatan Kolaboratif*. Schwab, K. (2016). *The Fourth Industrial Revolution*. Crown Business.
- Subiakto, H., & Sarwono, B. (2021). *Manajemen SDM dalam Era Digitalisasi Industri 4.0*. Jakarta: PT Gramedia Pustaka Utama.
- Tahar Achmad, dkk. (2022). Strategi Pengembangan Sumber Daya dalam Menghadapi Era Revolusi 4.0 Menuju Era Society 5.0. *Jurnal Pendidikan Tabulasi*. 6(2), 12380-12394. ISSN: 2614-3097.
- Wahyudi Angga dkk. (2023). Dampak Transformasi Era Digital Terhadap Manajemen Sumber Daya Manusia. *Jurnal Bintang Manajemen (JUBIMA)*. 1(4), 99-111. ISSN: 2963-4830.
- Wibowo (2019). *Manajemen Kinerja: Perspektif Sistem dan Organisasi*. Jakarta: Rajawali Pers.
- World Economic Forum. (2020). *The Future of Jobs Report 2020*. World.