

Transformation of Risk Management HR in the Digital Age: Adaptation to Technology and Global Uncertainty

Lady Yuliana¹, Indah Lestari Madelin²

^{1,2}Universitas Widyatama Bandung

Article Info

Article history:

Received July, 2025

Revised July, 2025

Accepted July, 2025

Keywords:

HR transformation,
risk management,
digital age,
digital competence,
global uncertainty

ABSTRACT

The development of digital technology and increasing global uncertainty have prompted organizations to carry out a comprehensive transformation in the risk management system, especially in the aspect of human resources (HR). This study aims to examine how organizations transform risk management HR in response to the challenges of digitalization and the dynamics of an unstable global environment. The approach used is qualitative descriptive with data collection techniques through in-depth interviews, documentation studies, and limited observation on several public and private sector organizations that have implemented digital risk management systems. The results of the study show that human resource transformation in risk management includes three main aspects: (1) digital competency development, especially in the use of risk technology and data analysis; (2) restructuring the role and function of human resources from administrative to strategic; and (3) the formation of an organizational culture that is adaptive to risks and uncertainties. These findings confirm that the success of modern risk management systems depends not only on technological sophistication, but also on the readiness and ability of human resources to manage risk proactively and collaboratively. This research recommends that organizations place HR transformation as a strategic priority in strengthening risk management in the digital era, with a holistic and sustainable approach.

This is an open access article under the [CC BY-SA](#) license.



Corresponding Author:

Name: Lady Yuliana

Institution: Universitas Widyatama Bandung

e-mail: lady.yuliana@widyatama.ac.id

1. INTRODUCTION

The rapid development of digital technology has brought significant changes in various aspects of the organization, including in risk management practices. In the digital age, threats and risks are no longer conventional, but increasingly complex, dynamic, and multidimensional. New risks such as cyberattacks, technological disruption, disinformation, and global market

volatility require organizations to have a resilient, adaptive, and data-driven risk management system. In this context, the transformation of human resources (HR) in risk management is a strategic need that cannot be ignored. HR not only plays a role as the implementer of risk policies, but also as a key factor in detecting, responding, and mitigating various forms of risks that arise in the digital era [1].

However, the main challenges faced are the limitation of digital competence, the lack of risk technology literacy, and the lack of integration between HR strategies and organizational risk management objectives. Many organizations are still fixated on rigid administrative approaches and have not adopted a comprehensive risk-based mindset across all levels of employees. Therefore, a holistic approach is needed that includes ongoing training, strengthening a risk-aware culture, and the use of artificial intelligence and predictive analytics technologies in the decision-making process. HR transformation must be directed at developing talents with cross-disciplinary capabilities, who are able to adapt quickly to changing environments and have the ability to interpret risk data strategically [2]. In addition, cross-functional collaboration and strengthening risk governance are an important foundation to ensure that risk management strategies are aligned with the overall direction of the organization's digital transformation. In the face of global pressures such as pandemics, climate change, geopolitical instability, and international regulatory dynamics, organizations that successfully transform their HR will have a greater competitive advantage in managing uncertainty and ensuring long-term sustainability [3].

HR transformation in risk management not only includes improving technical and digital competencies, but also includes role reformulation, organizational structure redesign, and strengthening a risk culture that is adaptive and responsive to change. This transformation demands a paradigm shift from a reactive approach to a proactive approach, where HR is able to anticipate risks before they become crises [4]. The role of HR is no longer limited to policy execution, but expanded to become a strategic partner in risk-based decision-making processes, predictive analysis, and ongoing crisis management. Therefore, this study aims to examine in depth how organizations design and implement HR transformation in risk management functions in response to technological pressures and increasing global uncertainty [5].

The main focus of this research is on structural adaptation strategies, identification of new competency needs based on digital and analytics, and strengthening the role of human resources as a catalyst in building an integrated, agile, and resilient risk management system. This research will also explore the mechanisms of continuous training and development, the formation of collaborative work ecosystems, and the role of transformative leadership in supporting the change process. Thus, this research is expected to make a conceptual contribution in building HR transformation models that are relevant to the context of digital disruption, while offering practical recommendations for organizations to improve their resilience and readiness in the face of the complexity of future risks [6].

2. METHODS

This research uses a qualitative approach with an exploratory descriptive type. This approach was chosen because it is in accordance with the research objectives that want to deeply understand the process of human resource (HR) transformation in the context of risk management in the uncertain digital era. With a qualitative approach, researchers can explore organizational dynamics contextually and in-depth, including adaptation strategies, challenges, and competency changes that occur in risk management human resources. The research was conducted on several public and private sector organizations in Indonesia, which have implemented a risk management system based on digital technology. The research subjects include stakeholders directly involved in the planning and implementation of risk management, including the Head of the Risk Management Division, the Head of HR, the Risk Analyst, the Chief Information Technology Officer (CTO/CIO), as well as the digital transformation and internal compliance team. These informants are selected purposively based on their strategic role in the transformation process [7].

The data collection techniques used in this study include semi-structured in-depth

interviews, documentation studies, and limited observations. The interview was conducted to explore information about the organization's strategy and experience in transforming human resources in the field of risk management. The documentation study is carried out by examining relevant policy documents, competency standards, and regulations. Meanwhile, observations were made on a limited basis on the implementation of digital-based risk management, especially related to the use of technology and human resource involvement. Data analysis is carried out using thematic analysis techniques, which include the stages of data transcription, coding, category grouping, and identification of main themes that reflect the HR transformation process. The findings were analyzed interpretively by referring to risk management theory and modern HR management theory. To maintain the validity of the data, the researcher used source triangulation, member check, and trail audit techniques. Triangulation was carried out by comparing data from various informant sources and documents, while member checks were carried out to re-validate the results of interviews with informants. Trail audits are used to systematically document the entire research process as a form of transparency and accountability.

3. RESULTS AND DISCUSSION

Based on the results of data collection through in-depth interviews, internal documentation analysis, and limited observation of several organizations that have implemented digital-based risk management systems, it was found that HR transformation in this context does not occur linearly but through a gradual and multidimensional process. The transformation process is centered on three main aspects that are intertwined and form a comprehensive ecosystem of change, namely: (1) Development of Risk HR Digital Competency, (2) Restructuring of the Role and Function of Risk Management HR, and (3) Adaptation of Work Culture to Global Uncertainty. These three aspects show that transformation is not

only about building technical capacity, but is also closely related to a shift in paradigms, mindsets, and organizational values in dealing with risks in the digital era [8].

These findings indicate that organizations that successfully build digital-based risk management systems are not only investing in technology, but also making serious efforts in revitalizing the role of HR as a key driver of change. The development of digital competencies includes increasing risk technology literacy, the use of analytical data, and mastery of digital tools. Meanwhile, the role restructuring emphasizes the importance of cross-disciplinary integration and the use of human resources as strategic partners, not just technical implementers. On the other hand, work culture adaptation reflects an organization's awareness of the importance of collective resilience and adaptability in the face of growing global uncertainty. By understanding these three dimensions in an integrated manner, organizations can strengthen institutional resilience and ensure that risk management serves as a key element in a long-term growth strategy amid a disruptive business landscape [9].

3.1 Development of Digital Competency of Risk HR

Most of the informants stated that the main challenge in the transformation of risk management HR is the low digital literacy among risk staff, especially at the operational level. A lack of understanding of cutting-edge technology makes it difficult for staff to identify, analyze, and respond to digital risks, such as cyberattacks, data manipulation, or cloud-based system disruptions. To answer this challenge, organizations began designing risk technology training programs that were not only technical, but also strategic. This program includes training in the use of risk management information systems (RMIS), mastery of the basics of data analytics and predictive modeling, a comprehensive understanding of cyber risk, as well as the application of artificial intelligence (AI) and machine learning in the process of early detection, mapping, and risk mitigation in real-time [10].

For example, in one of the national financial institutions, a structured phased training program with a digital risk certification scheme for risk analysts has been implemented. This certification is not only an instrument of competency validation, but also a prerequisite for promotion, thus encouraging the motivation of continuous capacity building. In several other organizations, training is conducted through blended learning methods, collaborations with risk technology startups, and scenario-based simulations to hone the acumen of risk analysis in complex situations. These efforts to develop digital competencies cannot be separated from the support of progressive leadership and an organizational culture that is open to innovation. By strengthening the digital capacity of risk HR, organizations not only improve responsiveness to digital threats, but also build a foundation of risk management that is modern, proactive, and adaptive to the future risk landscape [11].

3.2 Restructuring the Role and Function of Risk Management HR

The changes in the digital age have forced organizations to not only adopt new technologies, but also fundamentally reform the work structure and role of HR in the risk management function. Risk management functions that were once administrative, focusing on compliance, reporting, and documentation, are now shifting to more dynamic and strategic, with roles involving data utilization, artificial intelligence, and future risk-based decision-making. Organizations are beginning to realize that traditional siloed structures are no longer effective in dealing with interconnected and rapidly evolving digital risks [12].

In response, many organizations have formed new work units in the form of digital risk units or enterprise risk intelligence teams consisting of cross-disciplinary human resources. The team combines the competencies of data analysts, cybersecurity experts, financial risk analysts, and business strategic planners who work collaboratively to design a holistic and predictive risk management framework. This collaboration allows for the integration of insights from

multiple perspectives, so that decisions are made not only based on historical risks, but also projections and simulations of potential risks that could disrupt the organization's long-term goals [13].

Furthermore, the role of risk management HR is no longer limited to internal control or mitigation functions, but rather develops into a strategic partner for top management in formulating corporate policies and strategies that are adaptive to external dynamics. They are required to be able to read global trends, analyze the impact of international regulations, and integrate risk into the company's innovation and digital transformation processes. In addition, this shift is also driving changes in job design, performance evaluation systems, and risk HR career paths, which are now geared towards increasing strategic added value. With this restructuring, organizations not only strengthen their resilience to threats, but also position risk management as a driver of competitive advantage in a disruptive digital era [14].

3.3 Adapting Work Culture to Global Uncertainty

HR transformation in risk management is not only related to structural and technological aspects, but also includes the organizational culture dimension that is the foundation in responding to global uncertainty. The informant mentioned that external turmoil such as global pandemics, geopolitical tensions, economic fluctuations, and the impact of climate change have tested the organization's adaptive capacity as a whole. In this context, resilience is no longer understood simply as the ability to survive, but as a dynamic competence to rise, adapt quickly, and innovate in the face of unexpected pressures. Therefore, organizations are beginning to instill the values of a work culture that is more open to risk, flexible to change, and driven by a collaborative spirit across units [15].

The culture of reporting internal incidents, which was previously often considered a form of weakness, is now being reformed into a practice that is valued as part of the organization's learning process. The

reporting system is supported by the development of a data-based early warning system that allows early identification of potential operational and strategic disruptions. In addition, the principle of risk ownership began to be widely internalized, where each work unit was given full responsibility for identifying, managing, and reporting risks within their respective scopes. This not only reduces reliance on the risk division as a single control center, but also encourages accountability and risk awareness collectively across the organization's levels.

Some progressive organizations have even incorporated this risk culture dimension into their performance appraisal and leadership development systems, to ensure that the values of preparedness and uncertainty management are truly part of the organization's DNA. Through this process, the organization's work culture transforms from reactive to proactive, from one that rejects risks to one that manages risks as strategic opportunities. Thus, adapting a resilient and future-oriented work culture is one of the main pillars in strengthening effective risk management in an era of global uncertainty. In general, the results of the study show that the transformation of risk management human resources in the digital era not only requires mastery of technology, but also changes in mindset, work structure, and organizational values. Adaptive, collaborative, and digital-ready skills are key competencies sought in the recruitment and career development of high-risk HR today [16].

DISCUSSION

The results of the study show that the transformation of human resources in risk management in the digital era is not just a technical problem or the adoption of digital tools, but a comprehensive change that touches on aspects of individual competencies, organizational structure, and collective work culture. This transformation emerged as a strategic response to two main pressures that simultaneously shape the modern organizational landscape, namely the acceleration of digital technological advances and the increasing level of global uncertainty

due to multidimensional disruptions such as pandemics, climate crises, geopolitical turmoil, and international regulatory dynamics. These changes require organizations to not only update systems and work tools, but also build internal capacity that is able to adapt sustainably to rapid and unpredictable environmental changes [17].

First, in terms of digital competency development, these findings are in line with the Human Capital Theory framework which emphasizes the importance of continuous investment in human knowledge, skills, and cognitive abilities as the main assets that determine organizational productivity and competitiveness. The need for human resources who not only understand the principles of risk management, but are also proficient in risk information systems (RMIS), big data analytics, artificial intelligence (AI), and are able to understand the potential for cyber threats and disruptive technologies, is becoming increasingly crucial. Traditional administrative compliance-based competencies are now seen as inadequate in the context of rapidly changing and non-linear digital risks. Therefore, organizations are encouraged to reskilling and upskilling systematically, especially for risk positions that were previously not in direct contact with digital technology [18].

This step is also in line with international guidelines such as ISO 31000, which emphasizes that competence and risk awareness must be thoroughly instilled across the organization's lines, and be an integral part of an effective risk management system. In other words, HR transformation is not just about answering momentary needs, but is a long-term strategy to create an organizational ecosystem that is intelligent, adaptive, and resilient to face the complexity of risks in the digital era.

Second, the change in the role and function of risk HR reflects a fundamental shift from a reactive, administrative, and compliance-focused risk management approach, to a more strategic, proactive, and value-added approach. Within the framework of Enterprise Risk Management (ERM), risk management is no longer positioned as a

peripheral function that merely carries out supervision, but as a core element directly involved in the process of formulating and executing an organization's strategy. The research findings show that progressive organizations have begun to integrate risk management into the strategic planning cycle, using it as a mechanism to identify growth opportunities, estimate the impact of disruptions, and improve business resilience in the long term [19].

These changes are driven by the need to respond to an increasingly uncertain external environment, where risks arise at a rapid pace and are often cross-sectoral. In this context, risk HR is no longer enough to be just a compliance officer, but is required to be a strategic enabler who can utilize predictive technology, scenario planning, and risk intelligence to provide data-driven input in decision-making at the managerial and executive levels. In some organizations, cross-functional forums have been established that bring together risk analysts with strategic planners, finance departments, and innovation units to jointly design business strategies that are responsive to the dynamics of future risks [20].

Thus, the transformation of the role of human resources risks moving from a mere controller to a position as a co-creator of organizational value. They not only prevent losses or failures, but also contribute to the creation of a competitive advantage through innovative, integrated, and long-term insight-based risk management. This change also requires organizations to adjust the incentive structure, career path, and performance appraisal system for at-risk HR, to align with their new role as a proactive strategic partner in shaping the direction and future of the organization [21].

Third, the adaptation of work culture to global uncertainty shows the importance of building a culture of organizational resilience. Within the framework of adaptive organizational theory, a culture that is open to risk and change is essential to creating a risk management system that focuses not only on control, but also on learning and innovation. The implementation of an open incident

reporting system, early warning system, and the instillation of risk ownership principles are indications that organizations are not only relying on technology, but also forming risk-aware collective behavior. This is important, considering that no matter how sophisticated technology is, it will not be effective without the support of human resources who have awareness and responsibility for risks [22].

Overall, this discussion emphasizes that the success of risk management transformation is highly dependent on the readiness and capabilities of human resources. Organizations that are able to adapt are those that not only rely on technology, but are also able to prepare human resources holistically, both in terms of competencies, mindsets, and agile and collaborative work structures. Therefore, the HR transformation approach cannot be done partially, but must be part of the organization's long-term strategy in facing the era of global disruption and uncertainty.

4. CONCLUSION

This research shows that the transformation of human resources (HR) in risk management in the digital era is a key aspect that determines the resilience and adaptability of organizations in the face of technological disruption and global uncertainty. This transformation not only includes strengthening digital competencies, but also involves restructuring roles, developing a strategic mindset, and establishing a risk-aware organizational culture. First, the development of digital competencies is the main foundation in dealing with the complexity of modern risks, especially those related to technologies such as cyberattacks, big data, and artificial intelligence. Second, the shift in the role of HR from administrative functions to strategic partners in risk decision-making shows that risk management is now cross-functional and integrated with business direction. Third, an adaptive and responsive work culture is an important element in strengthening the overall risk management system, especially through the active involvement of all

organizational lines and the application of risk ownership principles. Thus, the success of risk management HR transformation is highly dependent on the organization's ability to build an ecosystem of continuous learning, cross-division collaboration, and the wise

application of technology. This research recommends that organizations not only focus on technology adoption, but also place human resource development as a strategic priority in building a resilient, proactive, and future-oriented risk management system.

REFERENCES

- [1] E. E. Bennett and R. R. McWhorter, "Virtual HRD's Role in Crisis and the Post Covid-19 Professional Lifeworld: Accelerating Skills for Digital Transformation," *Adv. Dev. Hum. Resour.*, vol. 23, no. 1, pp. 5–25, 2021, doi: 10.1177/1523422320973288.
- [2] N. Iriani, A. Agustianti, R. Sucianti, A. Rahman M, and W. Putera, "Understanding Risk and Uncertainty Management: A Qualitative Inquiry into Developing Business Strategies Amidst Global Economic Shifts, Government Policies, and Market Volatility," *Golden Ratio Financ. Manag.*, vol. 4, no. 2, pp. 62–77, 2024, doi: 10.52970/grfm.v4i2.444.
- [3] C.-S. Lu, C.-N. Hsu, and C.-H. Lee, "The Impact of Seafarers' Perceptions of National Culture and Leadership on Safety Attitude and Safety Behavior in Dry Bulk Shipping," *Int. J. e-Navigation Marit. Econ.*, vol. 4, pp. 75–87, 2016, doi: 10.1016/j.enavi.2016.06.007.
- [4] Ramadhan Ridho Fadlulloh Iswandi and Mudji Kuswinarno, "Transformasi Pengembangan Sumber Daya Manusia di Era Digital," *Inisiat. J. Ekon. Akunt. dan Manaj.*, vol. 4, no. 1, pp. 250–262, 2024, doi: 10.30640/inisiatif.v4i1.3525.
- [5] W. O. Musmiarny Nilammadi, Othy Happy Dharmaning Savitry, and Eni Wuryani, "The Concept Of Human Resource Management In The Life Of Business Organizations In The Digital Era," *Sinergi J. Ilm. Ilmu Manaj.*, vol. 14, no. 1, pp. 20–28, 2024, doi: 10.25139/sng.v14i1.8358.
- [6] Suhada, M. Humaira As-syiva, E. Saprida, and Arsyadona, "Strategi Manajemen Resiko Dalam Menghadapi Ketidakpastian Di Pasar Global," *J. Sains Student Res.*, vol. 3, no. 1, pp. 156–163, 2025.
- [7] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta., 2019.
- [8] V. Varenky and Z. Piskova, "Soft, hard, and digital skills for managers in the digital age: Business requirements and the need to master them," *Dev. Manag.*, vol. 23, no. 1, pp. 46–61, 2024, doi: 10.57111/devt/1.2024.46.
- [9] Y. Zhong, Y. Li, J. Ding, and Y. Liao, "Risk Management: Exploring Emerging Human Resource Issues during the COVID-19 Pandemic," *J. Risk Financ. Manag.*, vol. 14, no. 5, 2021, doi: 10.3390/jrfm14050228.
- [10] K. Davis, "Risk Management Strategies for Projects in the Context Of Digital Transformation," *Risk Manag. Publ.*, vol. 2, no. 129, pp. 1581–1587, 2023.
- [11] F. Sari, S. Iskandar, and Y. Fitriadi, "Resilience in Human Resource Management: How Organizations Adapt to Uncertainty and Crisis," *Int. J. Econ. Manag. Res.*, 2025.
- [12] B. Trenerry *et al.*, "Preparing Workplaces for Digital Transformation: An Integrative Review and Framework of Multi-Level Factors," *Front. Psychol.*, vol. 12, no. March, pp. 1–24, 2021, doi: 10.3389/fpsyg.2021.620766.
- [13] Z. Hussain, "Paradigm of technological convergence and digital transformation: The challenges of CH sectors in the global COVID-19 pandemic and commencing resilience-based structure for the post-COVID-19 era," *Digit. Appl. Archaeol. Cult. Herit.*, no. January, 2020.
- [14] H. Doost Mohammadian and C. Domann, "Overcoming SME Legal and Regulatory Challenges and Fostering Sustainable Collaboration and 7PS Engineering in the Digital Age through Integrating the X.0 Wave Theory & SME 5.0 Concept," *Intell. Sustain. Manuf.*, vol. 1, no. 2, pp. 10011–10011, 2024, doi: 10.35534/ism.2024.10011.
- [15] U. Porath, "Advancing Managerial Evolution and Resource Management in Contemporary Business Landscapes," *Mod. Econ.*, vol. 14, no. 10, pp. 1404–1420, 2023, doi: 10.4236/me.2023.1410072.
- [16] M. Rozman, D. Oreski, and P. Tominc, "A Multidimensional Model of the New Work Environment in the Digital Age to Increase a Company's Performance and Competitiveness," *IEEE Access*, vol. 11, no. January, pp. 26136–26151, 2023, doi: 10.1109/ACCESS.2023.3257104.
- [17] S. Surianto, B. Badaruddin, and A. Firman, "Human Resource Management Strategies to Increase Adaptability in the Digital Age," *Proceeding Res. Civ. Soc. Desemination*, vol. 2, no. 1, pp. 1–15, 2024, doi: 10.37476/presed.v2i1.56.
- [18] W. Ma, "Exploring the Transformation Effects of Digitalization on Traditional Human Resources Management," *Polish J. Manag. Stud.*, vol. 28, no. 2, pp. 182–202, 2023, doi: 10.17512/pjms.2023.28.2.11.
- [19] T. H. Hoang, T. T. M. Nguyen, T. Bui, A. D. T. Binh, H. Q. Truong, and M. S. Asif, "Employee ambidexterity and adaptive resources in the face of digital HRM changes: evidence from frontline banking staff," *Int. J. Product. Perform. Manag.*, vol. 74, no. 11, pp. 46–67, 2025, doi: 10.1108/IJPPM-12-2023-0689.
- [20] T. Galanti, C. De Vincenzi, I. Buonomo, and P. Benevene, "Digital Transformation: Inevitable Change or Sizable Opportunity? The Strategic Role of HR Management in Industry 4.0," *Adm. Sci.*, vol. 13, no. 2, 2023, doi: 10.3390/admsci13020030.
- [21] A. Setiyowati, "Determinasi Kepemimpinan Adaptif: Manajemen Risiko, Transformasi Digital dan Adaptif Perusahaan," *J. Pendidik. Siber Nusantara*, vol. 3, no. 1, pp. 37–49, 2025, doi: 10.38035/jpsn.v3i1.342.
- [22] S. K. Parker and G. Grote, "Automation, Algorithms, and Beyond: Why Work Design Matters More Than Ever in a Digital World," *Appl. Psychol.*, vol. 71, no. 4, pp. 1171–1204, 2022, doi: 10.1111/apps.12241.