

The Strategic Role of Human Resource Management in Facing Digital Transformation and Industry 4.0

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ABSTRACT

Human resource management (HRM) has become one of the key strategic functions in supporting organizational transformation in the digital era and Industry 4.0. Higher education institutions are required not only to adopt digital technologies but also to develop human resources capable of adapting to rapid technological changes. This study aims to analyze the strategic role of human resource management in supporting digital transformation at Universitas Islam Blitar. A qualitative descriptive approach was employed using in-depth interviews, observation, and documentation. The participants consisted of the head of the human resources division, lecturers, and administrative staff selected through purposive sampling. Data were analyzed using the interactive model of Miles and Huberman, including data reduction, data display, and conclusion drawing. The findings reveal that digital transformation has been gradually implemented through the digitalization of academic and administrative services. Human resource management plays an important role in improving employees' digital competencies through training and continuous assistance. However, several challenges remain, including disparities in digital literacy, resistance to organizational change, and limited technological infrastructure. The study concludes that effective digital transformation requires strategic human resource management capable of integrating competency development, organizational culture, and technological innovation. These findings contribute to the development of strategic human resource management practices in higher education institutions undergoing digital transformation.

Keywords: Human Resource Management, Digital Transformation, Industry 4.0, Higher Education, Digital Competency

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INTRODUCTION

The increasingly rapid development of digital technology has driven transformation in various sectors, including higher education. The Industrial Revolution 4.0 era is marked by the integration of digital technologies such as artificial intelligence, big data, and the Internet of Things (IoT), significantly changing organizational work patterns. This transformation requires organizations to adapt quickly to technological changes and increasingly complex new competency requirements (Putri, Nasution, Ansori & Yusup, 2026).

In this context, human resource management (HRM) plays an increasingly strategic role. The shift in HRM paradigm from an administrative to a more strategic one is a consequence of the development of the digital era. HRM no longer focuses solely on administrative workforce management but also plays a role in developing digital competencies, improving performance, and effectively supporting the achievement of organizational goals (Wahyudi, Assyamiri, Al Aluf, Fadhilah, Yolanda & Anshori, 2023). In fact, digital skills, data analysis, and adapting to technology have become key skills that HR must possess to face the dynamics of the modern workplace.

Furthermore, advances in information technology have brought significant changes to human resource management, particularly in the education sector. Digital transformation is changing the way organizations plan, recruit, develop, and evaluate employee performance. The use of technologies such as e-recruitment and e-learning has been shown to improve the efficiency and effectiveness of human resource management, although they also pose new challenges, such as competency gaps and changing workforce characteristics (Putri, Nasution, Ansori & Yusup, 2026).

The development of digital transformation is also driving significant changes in human resource management practices globally. Recent studies show that digitalization has transformed HR functions into becoming more data-, analytics-, and technology-driven, including in talent management and strategic decision-making (Eger & Žižka, 2024; Sakib et al., 2025). Furthermore, digital transformation in HR not only increases efficiency but also requires organizations to develop a more adaptive approach to rapid technological change (El Garem, 2026).

Accordingly, the success of digital transformation is heavily influenced by the readiness and quality of human resources. Competent and adaptive human resources are a key factor in determining an organization's success in navigating changes in the digital era. Competency development through training and skills enhancement is a crucial strategy for enhancing organizational competitiveness in facing global challenges (Asmiati, Sulastriani & Citta, 2023). This demonstrates that technology cannot stand alone without the support of adequate human resources.

However, various challenges remain in implementing digital transformation, particularly those related to human resource readiness. Differences in digital literacy levels, resistance to change, and limited training are key barriers to the adaptation process. Furthermore, organizations are required to develop appropriate talent management strategies to ensure the availability of human resources with competencies relevant to the needs of the Industry 4.0 era (Wahyudi et al., 2023).

Although various studies have examined the role of HR in digital transformation, most have focused on the industrial and corporate sectors. Studies within the context of higher education, particularly at the local institutional level, are relatively limited. Yet, universities play a crucial role as institutions that not only manage human resources but also produce human resources prepared to face global challenges.

This research was conducted at Balitar Islamic University, one of the universities currently undertaking a digital transformation in its academic and administrative systems.

This change requires human resources capable of adapting to technology, as well as the strategic role of HR in supporting this process.

Based on the description, the problem formulation in this study is: (1) how is the implementation of digital transformation in higher education, (2) what is the strategic role of HR in supporting digital transformation, and (3) what are the challenges faced in improving HR readiness in the Industry 4.0 era. The purpose of this study is to analyze the strategic role of HR in facing digital transformation and identify obstacles and strategies carried out in improving HR quality.

This research is expected to contribute theoretically to the development of human resource management, particularly regarding digital transformation in the higher education sector. Furthermore, it is expected to serve as a practical reference for university administrators in formulating adaptive and competitive human resource development policies and strategies in the Industry 4.0 era.

From a theoretical perspective, the importance of HRM in organizations has long been emphasized in classical literature. HRM is viewed as a strategic factor capable of creating competitive advantage through effective human resource management (Dessler, 2020; Armstrong, 2020). In the digital context, this role becomes even more complex as organizations must simultaneously integrate technology with HR competency development.

METHOD

This research uses a qualitative approach with descriptive methods. This approach was chosen because the research aims to understand in-depth the phenomenon of the strategic role of human resource management (HRM) in facing digital transformation and Industry 4.0. Through a qualitative approach, researchers can gather comprehensive information regarding the experiences, perceptions, and strategies implemented by organizations in facing technological change. This research was conducted at Balitar Islamic University, considering that the institution is undergoing a digital transformation process, particularly in its academic and administrative systems. The research period was carried out in 2026, covering the stages of data collection, analysis, and preparation of the research report.

The informants in this study were selected using purposive sampling, which involves selecting informants based on specific criteria relevant to the research objectives. The informants included the Head of Human Resources, lecturers, and educational staff directly involved in the digital transformation process within the organization. Data collection involved in-depth interviews, observation, and documentation. Semi-structured interviews were conducted to gather information related to the implementation of digital transformation, the strategic role of HR, HR readiness and competency, and the challenges and strategies faced by the organization. Observations were conducted to directly observe the work environment, technology use, and employee interactions with digital systems. Documentation was used to supplement research data, including organizational structure, digitalization policies, and HR training programs.

The data analysis technique in this study uses the interactive model from Miles and Huberman, which includes data reduction, data presentation, and conclusion drawing. Data reduction is carried out by selecting and simplifying data obtained from interviews and observations. Next, the data is presented in a descriptive narrative form for easy understanding and analysis. The final stage is drawing conclusions based on patterns, relationships, and findings that emerge from the research data. To ensure data validity, this study uses source triangulation and technical triangulation techniques, namely by comparing data from various informants as well as the results of interviews, observations, and documentation. In addition, member checking is also carried out to ensure the conformity of the data with the information provided by the informants. The research procedure is carried out through several stages, namely problem identification, literature review, informant selection, preparation of interview instruments, data collection, data analysis, and preparation of the research report.

FINDING AND DISCUSSION

RESEARCH RESULT

Implementation of Digital Transformation

The research results show that the implementation of digital transformation at Balitar Islamic University has been gradual and focused on the digitization of academic and administrative services. This change is evident in the use of an academic information system, the digitization of KRS (Student Registration Card) filling, and online grade management. This demonstrates the institution's efforts to improve service efficiency through the use of technology.

As conveyed by the informant:

"Digitalization on this campus has actually been underway for the past few years, especially since the pandemic. Almost all academic services are now online-based."
(Interview, 2026)

These changes impact not only work systems but also interaction patterns between lecturers, administrative staff, and students. Digitalization drives a shift from manual systems to more structured and well-documented technology-based systems. This finding aligns with the concept of digital transformation, which emphasizes that organizational change is not only technical but also encompasses comprehensive work processes and structures (Putri et al., 2026; Vial, 2019). According to Vial (2019), digital transformation is a complex process involving changes in organizational strategy, structure, and values, requiring time and thorough preparation for implementation.

However, the implementation of digital transformation has not been fully integrated. Some work units still combine manual and digital systems, as one informant explained:

"Not everything is perfectly integrated; there are still some parts that are a combination of manual and digital." (Interview, 2026)

This situation indicates that the organization is still in the digital transition phase. From a theoretical perspective, this stage is a critical phase that requires strategic planning to ensure a comprehensive and sustainable transformation. Without proper system integration, the efficiency potential of digitalization cannot be optimally maximized.

The Strategic Role of HR in Digital Transformation

The role of HR in supporting digital transformation at Balitar Islamic University demonstrates significant significance, particularly in the development of human resource competencies. HR plays a role not only in personnel administration but also in facilitating the technology adoption process.

This can be seen from the informant's statement:

"We in HR are trying to facilitate training, especially regarding the use of academic systems and learning technology." (Interview, 2026)

This role shows that HR has carried out its function as *change agent* within the organization. HR serves as the link between strategic leadership policies and technical implementation in the field. This function is crucial in ensuring that every digital transformation policy is accepted and implemented by all elements of the organization.

However, the research also found that the strategic role of HR is still suboptimal, particularly in long-term planning. This is reflected in the statement:

"There still needs to be strengthening, especially in long-term planning related to HR digitalization." (Interview, 2026)

This indicates that the role of HR has not yet fully reached the strategic level as described in Strategic Human Resource Management (SHRM) theory, which emphasizes the importance of integrating HR strategy with organizational strategy (Wahyudi et al., 2023; Bondarouk & Brewster, 2016). Bondarouk and Brewster (2016) emphasized that in the digital era, HR must be able to manage technology while developing human capabilities as a source of competitive advantage.

Human Resources Readiness and Competence

Human resource readiness for digital transformation shows significant variation among individuals. This difference is influenced by age, work experience, and digital literacy levels. Younger employees tend to adapt more quickly than more senior employees.

As conveyed by the informant:

"Young lecturers adapt relatively quickly, but senior lecturers do take longer." (Interview, 2026)

This difference indicates a digital competency gap that can become a barrier to the transformation process. If not managed properly, this gap can lead to performance disparities between individuals within an organization.

On the other hand, training and mentoring have proven to be effective solutions for improving human resource readiness. This is evident in the statement:

"It was quite difficult at first, especially with the new system. But after some training, I got used to it." (Interview, 2026)

This finding aligns with previous research stating that digital competency development is a key factor in improving HR readiness (Asmiati et al., 2023; Marler & Boudreau, 2017). Marler and Boudreau (2017) emphasized that data-driven HR management and competency development are crucial elements in improving organizational performance in the digital era.

Furthermore, recent research shows that HR readiness for digital transformation is significantly influenced by an organization's ability to provide technology-based training and create a work environment that supports continuous learning (Eger & Žižka, 2024). This emphasizes the need for systematic and sustainable HR competency development.

The Impact of Digital Transformation on HR Performance

Digital transformation has a significant impact on improving human resource performance, particularly in terms of work efficiency and effectiveness. Digitization enables faster, more accurate, and better documented work processes.

As expressed by the informant:

"With a digital system, work becomes faster, especially in managing grades and course materials." (Interview, 2026)

This increased efficiency demonstrates that technology can reduce manual workloads and accelerate task completion. This has a positive impact on employee productivity and the quality of service provided to students.

However, reliance on digital systems also poses new risks, particularly when technical disruptions occur. This is reflected in the statement:

"If the system is in error, it actually hinders work because everything depends on technology." (Interview, 2026)

These findings indicate that digital transformation must be balanced with infrastructure readiness and technological risk management. This aligns with Verhoef et al.'s (2021) assertion that the success of digital transformation is determined not only by technology but also by the organization's readiness to manage risk and change.

Challenges in Digital Transformation

Digital transformation at Balitar Islamic University faces various challenges, both technical and non-technical. One of the main challenges is the limited digital competence of its human resources.

"Not all human resources have the same digital capabilities." (Interview, 2026)

Furthermore, resistance to change is also a significant obstacle. HR accustomed to manual systems tend to struggle to adapt to digital systems.

"There are some who are still comfortable with the old ways." (Interview, 2026)

Another challenge is technical system constraints, such as disruptions or infrastructure limitations.

"Sometimes the system errors or is slow." (Interview, 2026)

These findings align with research stating that resistance to change and limited competencies are key barriers to digital transformation (Wahyudi et al., 2023; Vial, 2019). Therefore, a comprehensive approach encompassing technological, human, and organizational aspects is required.

HR Strategy in Facing Digital Transformation

To address these challenges, HRD implemented a strategy focused on human resource development through training and mentoring. This strategy was implemented in stages to ensure acceptance by all employees.

"We try to do the training in stages so that everyone can participate." (Interview, 2026)

The approach used is also persuasive and adaptive, as expressed by the informant:

"It can't be forced, it has to be done slowly and adjusted to the condition of human resources." (Interview, 2026)

This approach demonstrates that successful digital transformation cannot be achieved instantly but requires a continuous process of adaptation. In change management theory, a participatory and incremental approach is an effective strategy for reducing resistance and increasing acceptance of change.

In a strategic context, an adaptive and technology-driven HR approach has been proven to increase the effectiveness of an organization's digital transformation. This aligns with Armstrong's (2020) perspective, which emphasizes that HR strategies must be flexible and responsive to changes in the external environment, including developments in digital technology.

Furthermore, regular evaluation of training systems and programs is also a crucial part of the HR strategy. This evaluation aims to ensure that the transformation process is proceeding according to established objectives.

This is in line with the theory that states that the success of digital transformation is highly dependent on the organization's ability to manage change and build an adaptive culture (Verhoef et al., 2021; Bondarouk & Brewster, 2016).

DISCUSSION

The findings of this study indicate that digital transformation at Universitas Islam Balitar has gradually changed academic and administrative work processes through the implementation of academic information systems, online course registration, online grade management, and digital learning facilities. These changes demonstrate that digital transformation has begun to contribute to greater efficiency and accessibility in organizational activities; however, its implementation remains in a transitional stage because several work units continue to combine digital and manual procedures. This condition shows that the implementation of digital technology alone is not sufficient to achieve comprehensive organizational transformation, because technological change must be accompanied by changes in work processes, employee competencies, and organizational management. In this process, Human Resource Management (HRM) becomes a strategic factor because the effectiveness of digital transformation depends largely on employees' ability and willingness to adapt to new technologies.

The findings show that HRM has supported this adaptation through training, mentoring, and assistance in the use of digital systems, although differences in employee readiness remain evident, particularly between employees who adapt relatively quickly to technology and those who require more time and assistance. This indicates that digital transformation creates not only opportunities for efficiency but also challenges related to competency gaps and employee adaptation. The finding is consistent with Vial (2019), who explains that digital transformation involves changes in organizational processes, structures, and strategies rather than merely the adoption of new technologies. It is also in line with Bondarouk and Brewster (2016), who emphasize that HRM in the digital era needs to assume a more strategic role by aligning technological developments with human capabilities. Furthermore, the importance of employee competency development identified in this study supports Asmiati et al. (2023), while the role of technology-oriented HRM in supporting organizational performance corresponds with Marler and Boudreau (2017). The finding that employees can improve their ability to use digital systems through training and organizational support is also consistent with Eger and Žižka (2024), which emphasizes continuous learning and organizational support as important elements of digital readiness.

At the organizational level, the increased efficiency of administrative activities supports the perspective of Verhoef et al. (2021), which explains that digital transformation can create organizational value when technological change is accompanied by adequate organizational capabilities. Nevertheless, the occurrence of technical problems and the continued use of manual procedures demonstrate that digital transformation may also generate operational challenges and that the benefits of digitalization cannot be separated from the quality of infrastructure, system integration, and employee readiness. Similarly, difficulties experienced by some employees in adapting to new technologies indicate that resistance or hesitation toward change needs to be addressed through communication, training, mentoring, and gradual implementation, as reflected in Vial (2019) and Wahyudi et al. (2023). Thus, the findings collectively suggest that the success of digital transformation

at Universitas Islam Balitar is determined by the alignment between technology, human resources, and organizational management, with HRM functioning as a bridge that connects technological implementation with employee capability and organizational objectives. However, these findings should be interpreted within several limitations.

The study was conducted at only one institution, namely Universitas Islam Balitar, so its findings primarily reflect the specific organizational context and cannot automatically be generalized to other universities. In addition, the qualitative descriptive approach and purposive selection of informants provide an understanding of employee experiences and perceptions but do not provide statistical measurements of the relationship between digital transformation, employee competence, and organizational performance. Moreover, because digital transformation is an ongoing process, the organizational conditions identified in this study may change as technology, infrastructure, employee competencies, and HRM policies continue to develop. Based on these findings, the practical implication is that Universitas Islam Balitar needs to strengthen long-term digital HRM planning by integrating continuous competency development, differentiated training, mentoring, technical support, and evaluation of employee readiness into its digital transformation strategy. At the same time, the university needs to strengthen the integration of digital systems, technical infrastructure, data protection, system maintenance, and risk-management mechanisms so that technological improvements can be sustained and translated into organizational performance. For future research, comparative studies involving several universities and longitudinal research are needed to examine how digital competencies, employee adaptation, and organizational performance develop over time. Future studies may also combine qualitative approaches with quantitative indicators of employee performance, digital competence, training effectiveness, and service efficiency to provide a more comprehensive understanding of the relationship between strategic HRM and digital transformation.

CONCLUSION

Based on research conducted at Balitar Islamic University, it can be concluded that digital transformation has been gradually implemented in academic and administrative systems. The implementation of digitalization has been proven to increase work efficiency and effectiveness, particularly in data management and academic services. However, this implementation has not been fully integrated, resulting in a combination of manual and digital systems in some work activities.

The strategic role of human resource management (HRM) in navigating digital transformation demonstrates a significant contribution, particularly in competency development through training and mentoring. HRM serves as both a facilitator and agent of change, helping employees adapt to technology. However, this role still needs to be strengthened, particularly in long-term digital-based strategic planning, to support the transformation more systematically and sustainably.

Human resource readiness and competency are key factors in the success of digital transformation. This study found a digital skills gap between individuals, particularly

between younger and more senior employees. This situation highlights the importance of continuous competency development to ensure that all human resources have equal adaptability. On the other hand, digital transformation also has a positive impact on improving human resource performance, particularly in terms of productivity and work efficiency. However, reliance on digital systems also carries risks, such as technical disruptions that can disrupt work processes.

Furthermore, this study identified several key challenges in digital transformation, namely limited digital competency, resistance to change, and technological infrastructure constraints. These challenges demonstrate that digital transformation is not only about implementing technology but also involves human aspects and organizational culture. Therefore, the success of digital transformation depends heavily on an organization's ability to manage change and continuously improve the quality of its human resources.

Based on these findings, several recommendations can be put forward, including the need to strengthen the strategic role of HR through the integration of HR development policies with long-term digital transformation strategies. Organizations also need to improve digital competency training and development programs in a sustainable and structured manner, taking into account the varying levels of human resource capabilities. Furthermore, improving the quality of technology infrastructure and integrating information systems is crucial to support a smooth digitalization process. Furthermore, organizations need to build a work culture that is adaptive to change through a persuasive and participatory approach to reduce employee resistance. For future researchers, it is recommended to expand this research by adding other variables and using a mixed-methods approach to obtain more comprehensive results.

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