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Information Technology Utilization in Organizational Human Resource Development: A Qualitative Study

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ABSTRACT

Digital transformation has reshaped organizational landscapes, including how organizations develop human resource (HR) competencies. Information technology (IT) has become a strategic infrastructure supporting employee learning, training, and career development. This study aims to explore the forms of IT utilization in HR development, identify supporting and inhibiting factors, and analyze their implications for the effectiveness of HR development at the organizational level. The study employs a qualitative approach with a case study design at Universitas Islam Negeri (UIN) Abdul Muthalib Sangadji Ambon, formerly IAIN Ambon. Data were collected through semi-structured interviews with ten informants, participatory observation, and documentation studies, and analyzed using the Miles and Huberman interactive model. Data validity was maintained through source and method triangulation. The findings indicate six principal forms of IT utilization in HR development: Learning Management Systems (LMS), virtual training and blended learning, mobile learning/microlearning, HR Information Systems (HRIS) for career planning, community-based knowledge management systems, and people analytics for identifying development needs. Supporting factors include leadership commitment, infrastructure readiness, and employee digital literacy, while inhibiting factors include cross-generational digital competency gaps, workload constraints, and insufficient evaluation of digital learning's impact on performance. This study contributes contextual insights into organizational actors' experiences of IT integration in HR development and highlights its potential to support adaptive, technology-based HR development. The findings also provide practical considerations for HR practitioners in designing employee digital capability strategies.

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INTRODUCTION

The rapid development of information technology (IT) over the past decade has driven fundamental changes in organizational management, including human resource (HR) management. The Industrial Revolution 4.0 has reshaped HR management practices through the increasing integration of digital technologies into organizational processes, while the subsequent discourse on Society 5.0 emphasizes a more human-centered integration of technology into social and organizational life (Bondarouk & Ruël, 2009; Nasar et al., 2021; Ashadimas, 2025). This acceleration became increasingly evident in the aftermath of the COVID-19 pandemic, which encouraged organizations and educational institutions to rapidly adopt digital-based work and learning models (Hwang et al., 2020). In this context, information technology is no longer merely an administrative support tool but has increasingly become a strategic infrastructure supporting HR management functions, particularly employee competency and capability development (Yoon et al., 2024).

HR development is one of the HR management functions most affected by digital transformation. Whereas in the past HR development was synonymous with face-to-face training in classrooms (classroom training), organizations are now required to provide learning mechanisms that are flexible, accessible anytime and anywhere, and capable of accommodating diverse learning

needs. Learning Management Systems (LMS), online learning platforms, mobile learning applications, and the use of data analytics to map individual development needs have increasingly become common instruments used by Learning and Development (L&D) units in various organizations, both in inherently technology-based sectors and conventional sectors such as financial services, manufacturing, government, and higher education including state Islamic higher education institutions, which have so far been relatively rarely studied in the context of information technology-based HR development.

Nevertheless, the adoption of information technology in HR development does not always proceed smoothly in practice. Various organizations experience a gap between the availability of technological infrastructure and the readiness of human resources to utilize it optimally. Investments in digital learning platforms are often not accompanied by changes in mindset and a culture of self-directed learning among employees. On the other hand, most empirical studies on the relationship between information technology and HR development are still dominated by quantitative approaches that measure correlations or effects between variables, and therefore are less capable of capturing in depth how information technology is actually interpreted, experienced, and utilized by organizational actors in everyday HR development practices.

Previous research on e-HRM has extensively examined the factors influencing technology adoption and its consequences for organizational performance. A systematic review of e-HRM adoption research identified major themes related to the factors and outcomes of e-HRM adoption, while a meta-analysis further demonstrated the relationships between system, organizational, user, and social factors and e-HRM adoption and performance (Pagnozzi, 2022; Alainati et al., 2023). Recent research on digitalization and human resource development has also examined the relationship between digitalization, HRD, and employee competencies using quantitative approaches, such as structural equation modeling (Dohnalová & Zelenková, 2025; Tamphu et al., 2024). These studies provide important evidence regarding the determinants, outcomes, and relationships associated with digital HRM and HRD. However, they provide less detailed insight into how organizational actors experience and interpret the concrete use of information technology across different HR development practices within a specific organizational context.

Building on this gap, the present study explores the concrete forms of information technology utilization in HR development from the perspectives of organizational actors, including L&D managers, line managers, and employees as users, while also identifying the supporting and inhibiting factors underlying such utilization. Rather than measuring the statistical effects of information technology on performance or training effectiveness, this case study focuses on the processes, experiences, and contextual factors that shape how technology is integrated into HR development practices. In this way, the study complements existing e-HRM and digital HRD research by providing contextual evidence of how technology is used, experienced, supported, and constrained in organizational HR development, thereby offering a more practice-oriented understanding of technology integration beyond its measurable adoption and performance outcomes.

Based on the foregoing description, this study formulates three research questions as follows: 1) What are the forms of information technology utilization in HR development in the organization under study?; 2) What are the supporting and inhibiting factors in the utilization of information technology for HR development?; 3) What are the implications of such information technology utilization for the effectiveness of HR development at the organizational level?. In line with these research questions, this study aims to: (1) describe and analyze the forms of information technology utilization in HR development; (2) identify the supporting and inhibiting factors in the utilization of information technology in the context of HR development; and (3) analyze the implications of information technology utilization for the effectiveness of organizational HR development. Theoretically, this study is expected to enrich the literature on HR management, particularly in the domain of technology-enabled human resource development, through a qualitative approach that remains relatively limited in number. Practically, the research findings are expected to serve as considerations for HR practitioners and policymakers in designing more adaptive and contextual strategies for developing employees' digital capabilities.

Furthermore, it is important to emphasize that the term “information technology” in the context of this study is not limited solely to hardware or software, but encompasses the entire digital ecosystem that enables HR development processes to take place in a connected, measurable, and personalized manner. This ecosystem includes learning platforms, personnel information systems, internal communication applications, and data infrastructure that supports development needs analysis. A comprehensive understanding of this ecosystem is important to ensure that the study does not become confined to a partial discussion of technology, but rather is able to capture the interrelationships among the components that collectively shape HR development practices in the field.

METHOD

This study employed a qualitative approach with a case study design, which was selected because the aim of the study was to obtain an in-depth and contextual understanding of information technology utilization in human resource development within a specific organizational unit, as experienced by its actors. The case study design enabled the researcher to explore the complexity of the phenomenon within a real-life context without separating the phenomenon from its context. The study was conducted at Universitas Islam Negeri (UIN) Abdul Muthalib Sangadji Ambon, formerly known as Institut Agama Islam Negeri (IAIN) Ambon before its change in status in 2025, located on Jalan Dr. H. Tarmizi Taher, Kebun Cengkeh, Batu Merah Atas, Ambon City, Maluku Province. Data collection was conducted during the research period in 2026. The researcher served as the primary instrument in data collection and interpretation, conducting the interviews, observations, and documentation process directly. Throughout the research process, the researcher maintained reflexivity by critically considering the potential influence of the researcher's position, interactions with informants, and interpretations of the data. The researcher also compared information across different informants and data collection methods to minimize the influence of individual perspectives on the interpretation of the findings.

The campus was purposively selected because, as a state Islamic higher education institution that had recently undergone institutional transformation, UIN Abdul Muthalib Sangadji Ambon was actively implementing various information technology-based HR development initiatives for both lecturers and education personnel as part of strengthening governance and academic competitiveness following the change in institutional status. These characteristics made the institution a relevant case for examining how information technology is utilized in HR development and the contextual factors that support or hinder its implementation. Before data collection, the researcher obtained informed consent from all participants after explaining the purpose of the study, the voluntary nature of participation, the use of the collected information, and the confidentiality of their responses. Ethical procedures were followed in accordance with [name of institutional ethics committee/ethical approval procedure, if applicable]. The identities of the informants were anonymized using codes (e.g., Informant 1, Informant 2, etc.) to maintain confidentiality and provide a comfortable setting for informants to express their views openly, although the name of the institution was disclosed as the research locus.

The research informants were determined using purposive sampling with the following criteria: (a) direct involvement in the planning or implementation of information technology-based HR development programs, or (b) active users of the organization's digital learning platforms within the past year. Based on these criteria, the study involved ten informants consisting of: one Head of the Personnel/Human Resources Division, two staff members of the Personnel Division responsible for employee development, three heads of work units (deans/vice deans of faculties and heads of divisions/subdivisions), three lecturers, and one education personnel member as an active user of the digital learning platform and personnel information system. This number was considered adequate because the data had reached the point of saturation (data saturation), namely a condition in which additional interviews no longer generated significant new themes.

Data were collected through three complementary techniques. First, semi-structured interviews were conducted using an interview guide covering the main domains of information technology utilization in HR development, including the forms of technology utilized, its

implementation in employee learning and development, supporting and inhibiting factors, and its implications for HR development. The semi-structured format allowed the researcher to explore issues that emerged naturally during the conversations. Each interview lasted between 30 and 45 minutes, was recorded with the informants' consent, and transcribed verbatim.Second, participant observation was conducted during [number] online learning sessions over a period of [duration] to obtain contextual insights beyond what was conveyed in the interviews. The researcher observed the implementation of online learning activities, employees' use of the LMS platform, interactions during learning sessions, and the ways in which technology was integrated into HR development activities. Field notes were recorded during and after the observation to document relevant activities and contextual information. Third, a documentation study was conducted by examining HR development policies, LMS usage reports, digital training materials, and other relevant documents related to the implementation of technology-based HR development. These documentary sources were reviewed to complement and triangulate the interview and observation data, thereby providing a more comprehensive understanding of information technology utilization in HR development.

Data analysis followed the interactive model of Miles and Huberman, consisting of three stages that took place simultaneously and iteratively: (1) data reduction, (2) data display, and (3) conclusion drawing/verification. During data reduction, interview and observation transcripts were read repeatedly and relevant segments were identified and assigned initial codes based on the research questions and issues emerging from the data. Similar and conceptually related codes were subsequently compared, consolidated, and grouped into broader categories, which were then developed into themes representing recurring patterns in information technology utilization, as well as its supporting and inhibiting factors (Prastyaningtyas et al., 2023; Al Ayyubi et al., 2025). Data display involved organizing the coded and categorized data into narrative descriptions and thematic matrices to facilitate the identification of patterns and relationships among themes. Conclusion drawing and verification involved interpreting emerging patterns and repeatedly comparing the findings across informants and data sources to assess their consistency.

The coding and theme-development process was conducted iteratively, with codes and categories reviewed and refined as additional data were examined. [If applicable: The coding process and emerging themes were independently reviewed by [another researcher/colleague] to assess the consistency of the coding and interpretation.] Data collection and analysis continued until [no substantially new codes or themes emerged from subsequent interviews and observations], which was used as the operational criterion for data saturation. Data validity was maintained through source triangulation by comparing information from informants with different backgrounds and method triangulation by comparing interview, observation, and documentation data. Member checking was conducted by reconfirming the preliminary interpretations with several key informants to assess whether the interpretations accurately reflected the meaning of the information they had provided. Feedback from the informants was considered in refining the relevant interpretations.

RESULTS AND DISCUSSION

Profile of the Research Object and Informants

UIN Abdul Muthalib Sangadji Ambon is a state Islamic higher education institution in the eastern region of Indonesia, with an academic community consisting of hundreds of lecturers and education personnel distributed across several faculties and work units. In recent years, and increasingly intensified following the change in status from IAIN to UIN in 2025, the university has begun implementing digital learning platforms and an integrated personnel information system (SIMPEG) as part of strengthening HR governance, driven by the need to accelerate the improvement of lecturers' academic qualifications, expand access to training for education personnel, and reduce budgetary and time constraints associated with conventional face-to-face training. The ten research informants had work experience ranging from three to twenty years, with a relatively wide age range (28–55 years), thereby enabling the exploration of diverse perspectives on cross-generational technology adoption within the academic community.

Forms of Information Technology Utilization in Human Resource Development

Learning Management System (LMS)

All informants from the Personnel Division stated that the LMS serves as the backbone of HR development at the university. The LMS is used to distribute mandatory learning modules for lecturers and education personnel, including training on technology-based learning development, academic writing, and strengthening religious moderation. It is also used to monitor training completion rates and centrally store the development history of each employee. As explained by the Head of the Personnel Division:

"[Insert the exact verbatim quotation from the Head of the Personnel Division regarding the LMS as the backbone of HR development and its use for monitoring and documenting employee development]." (Informant 1, Head of the Personnel Division)

The use of the LMS also changed the way training participation was monitored. Before its implementation, training participation was monitored manually through physical document recapitulation, which was time-consuming and prone to errors. Following the implementation of the LMS, training participation can be monitored in real time and systematically documented, including for reporting purposes to the Ministry of Religious Affairs. As the Head of the Personnel Division further explained:

"[Insert the exact verbatim quotation describing the difference between manual monitoring before the LMS and real-time monitoring and reporting after its implementation]." (Informant 1, Head of the Personnel Division)

These interview findings were complemented by observations of LMS use and documentation related to HR development activities, which provided additional evidence of the platform's role in distributing learning materials, monitoring participation, and documenting employee development.

Virtual Training and Blended Learning

Training for lecturers and education personnel, which was previously conducted entirely face-to-face, has now largely shifted to a blended learning format, namely a combination of online sessions through video conferencing applications and shorter face to face practical sessions. Several faculty leaders considered this format effective for conceptual materials, such as academic policies or online learning methodologies, while still maintaining face to face sessions for materials requiring direct interaction simulations, such as academic services training for students. These findings indicate that blended learning is practiced selectively based on the characteristics of the material, rather than being uniformly applied to all types of training.

Mobile Learning and Microlearning

Most of the lecturers and education personnel interviewed appreciated the availability of five- to ten-minute microlearning modules that could be accessed through applications on smartphones between teaching or working hours. This format was considered more suitable for the demanding schedules of lectures and the three pillars of higher education (tridharma perguruan tinggi) than conventional long-duration training modules. Nevertheless, several informants also revealed that limited internet connectivity in several areas of Ambon City, particularly during certain seasons with weather-related disruptions, remains a technical obstacle to consistently accessing mobile learning modules a challenge that is relatively distinctive to higher education institutions in archipelagic regions such as Maluku.

Personnel Information System (SIMPEG) for Career Planning

The Personnel Information System (SIMPEG) at this university is not only used for personnel data administration and reporting to the Ministry of Religious Affairs, but has also begun to be utilized to map the profiles of academic qualifications, functional positions, and competencies of lecturers and education personnel as a basis for career path planning, including further study

planning and proposals for academic positions (Shahriar et al., 2023). Informants from faculty leadership stated that data in SIMPEG helps facilitate the identification of prospective participants in academic leadership development programs (e.g., prospective heads of study programs) more objectively than before, when the process tended to rely on subjective assessments by unit leaders.

Knowledge Management System and Digital Learning Communities

The university has also developed internal discussion forums based on messaging applications and collaboration platforms as a medium for sharing tacit knowledge among lecturers, particularly best practices in developing digital teaching materials, student supervision strategies, and writing indexed journal articles. Several informants considered these cross-study-program digital communities effective for informal learning, although participation remains highly dependent on individual initiative and has not yet been formally integrated into the lecturer workload assessment system (BKD) or career development (Maira Shakeel & Omar Ahmed Shaikh, 2025).

People Analytics for Identifying Development Needs

The utilization of HR analytics data at the university is still at an early stage. The Personnel Division has begun using training completion rates, online assessment results, and lecturers' functional position data to identify competency gaps at the faculty level, but its utilization has not yet expanded to predictive analysis of individual development needs, such as projections of further study needs or acceleration of academic positions. The Head of the Personnel Division stated that limited internal data analysis capabilities constitute one of the obstacles to optimizing the potential of people analytics, even though the data itself is already available in SIMPEG and LMS.

Supporting Factors in Information Technology Utilization

Thematic analysis of the interview data identified three main supporting factors. First, the support and commitment of university leadership, as reflected in the allocation of investment budgets for learning technology and policies requiring the use of LMS and SIMPEG, particularly following the change in status to UIN, which requires strengthened technology-based governance. Second, the readiness of technological infrastructure within the university environment, particularly internet networks and computer equipment in most faculties, which enables relatively stable access to digital learning platforms. Third, the relatively adequate level of digital literacy among lecturers and education personnel, particularly among younger age groups and lecturers with educational backgrounds in information technology, which accelerates the adoption of new learning technologies without requiring intensive assistance.

Inhibiting Factors and Challenges

On the other hand, this study also revealed several inhibiting factors. First, the gap in digital competencies across generations of lecturers and education personnel, whereby employees with longer periods of service tend to require more time to adapt and additional assistance in using digital platforms. Second, the high workload associated with the three pillars of higher education teaching, research, and community service causes some lecturers to allocate time for digital learning outside formal working hours, potentially resulting in additional fatigue and reduced learning motivation in the long term. Third, limited internet connectivity, which constitutes a distinctive challenge in archipelagic regions such as Maluku, hinders consistent access to digital learning modules, particularly for employees residing outside Ambon City. Fourth, the lack of evaluation mechanisms that systematically measure the impact of digital learning on actual performance changes in the field for example, on the quality of classroom instruction or the productivity of scientific publications means that the effectiveness of investments in learning technology cannot yet be fully demonstrated in measurable terms by the university.

Implications for the Effectiveness of HR Development

The findings indicate that information technology has improved the efficiency of HR development delivery and expanded its reach, particularly through the distribution of training materials and monitoring of participation. This finding is consistent with recent research on e-HRM,

which shows that digital systems can streamline HR processes, improve accessibility to HR services, and support more systematic management of employee-related information. Similarly, research on digital HRD and digital learning indicates that technology-enabled learning can expand access to training and facilitate more flexible and continuous employee development. However, the findings of this study also show that improvements in delivery do not necessarily translate into equivalent improvements in development outcomes. The substantive effectiveness of HR development, particularly the extent to which digital learning contributes to changes in employee competencies and work behavior, remains constrained by an insufficiently strong culture of self-directed learning and weak systems for evaluating learning impacts (Gascó et al., 2004). This is in line with recent research emphasizing that the availability and use of digital learning technologies alone do not ensure the achievement of meaningful learning or competency outcomes.

The findings further suggest that the distinction between delivery efficiency and outcome effectiveness is important for understanding technology-enabled HR development. In the present case, information technology has transformed how HR development is delivered by making training materials more accessible, participation easier to monitor, and employee development information more systematically documented. However, the transformation of development outcomes remains less evident because learning engagement and impact evaluation are not yet sufficiently developed. This finding complements research on digital learning and people analytics, which emphasizes the importance of moving beyond technology adoption toward the evaluation of learning outcomes and the use of employee data to identify development needs and assess their effects (Banerjee, 2022). Thus, the key contribution of this study is the empirical observation that technology integration in HR development may produce greater efficiency in the delivery process while its effects on substantive development outcomes remain dependent on organizational learning practices and evaluation mechanisms.

Interestingly, the gap between delivery efficiency and outcome effectiveness is not interpreted uniformly by all informants. The Personnel Division tends to measure program success in terms of the reach and participation rates of lecturers/education personnel, whereas faculty leaders place greater emphasis on the extent to which training outcomes are reflected in changes in the quality of learning and the performance of the three pillars of higher education by lecturers within their respective work units. This difference in perspectives indicates a perception gap between the unit that designs development programs and the unit that directly experiences their impacts, which has the potential to hinder the refinement of information technology-based HR development programs if it is not bridged through a structured feedback mechanism between the Personnel Division and faculty leadership.

Theoretical Discussion and Novel Contribution

The findings of this study reinforce and further contextualize the e-HRM framework proposed by Marler and Fisher by illustrating different levels of technology utilization in HR development. At the relational level, the findings confirm that LMS, blended learning, and mobile learning have become established practices that facilitate interaction, access to learning resources, and employee development. This finding is consistent with recent empirical research showing that digital technologies can expand access to learning and support more flexible forms of employee development (Agustino et al., 2026). At the same time, the findings indicate that technology utilization does not necessarily progress uniformly across different HR development functions.

At the transformational level, particularly in the utilization of people analytics for strategic development decision-making, the organization remains at an emergent or developing stage. The main constraint identified in this study is not the availability of employee-related data itself, but limited internal analytical capabilities to transform available data into actionable information for HR development decisions. This finding adds an important contextual nuance to contemporary e-HRM and people analytics research, which emphasizes the strategic potential of data-driven HRM but also identifies analytical capability as an important condition for realizing that potential (Capece & Campisi, 2013). Thus, the findings suggest that the progression from relational to transformational e-HRM should not be understood simply as a consequence of increasing technology adoption or data

availability; it also depends on the organization's capacity to interpret and strategically utilize employee data.

Practically, this finding implies that the organization needs to strengthen internal analytical capabilities alongside continued investment in digital HR systems. This may include developing employees' data-analysis skills, establishing clearer procedures for using employee data in HR development planning, and strengthening mechanisms for evaluating whether digital learning activities contribute to changes in employee competencies and work performance. Such measures would help the organization move from using technology primarily to facilitate HR development delivery toward using technology and employee data to support more strategic and evidence-based HR development decisions.

In addition, this study contributes a contextual understanding that the success of information technology-based HR development is not solely determined by the sophistication of the technology adopted, but rather by the complex interaction among infrastructure readiness, organizational cultural readiness for self-directed learning, and the existence of adequate impact evaluation mechanisms. These three elements are interrelated and cannot be understood separately—a nuance that tends to be obscured in quantitative studies focusing on testing direct effects among variables. This constitutes the main novel contribution of this study to the body of knowledge on information technology-based HR development.

Research Limitations

This study has several limitations that need to be openly acknowledged. First, the use of a single-case study design has consequences for the limited generalizability of the findings to other organizational contexts with different sectoral, scale, or organizational cultural characteristics; the transferability of the findings is more appropriately understood analytically (analytic generalization) rather than statistically. Second, although source and method triangulation were conducted, the research data remain highly dependent on the subjective perceptions and experiences of the informants, which may have been influenced by situational factors at the time the interviews were conducted. Third, this study is cross-sectional in nature and has not captured the dynamics of changes in information technology utilization for HR development longitudinally, even though technology adoption is a continuously evolving process over time. These limitations provide opportunities for future research to further deepen or expand the findings generated by this study.

CONCLUSIONS

This study concludes that information technology utilization in HR development at UIN Abdul Muthalib Sangadji Ambon is manifested in six main forms: Learning Management System (LMS), virtual training and blended learning, mobile learning/microlearning, the Personnel Information System (SIMPEG) for career planning, a knowledge management system based on cross-study-program digital communities, and people analytics for identifying the development needs of lecturers and education personnel. The utilization of these technologies is supported by university leadership, particularly the momentum to strengthen governance following the change in institutional status to UIN, the readiness of campus infrastructure, and the digital literacy of the academic community. However, their implementation remains constrained by intergenerational digital competency gaps, the tridharma workload that limits learning time, limited internet connectivity in the Maluku archipelagic context, and weak evaluation of the impact of digital learning on actual performance. The principal scientific contribution of this study is the identification of a contextual distinction between the efficiency of HR development delivery and the effectiveness of its substantive outcomes. The findings show that information technology has improved the delivery and accessibility of HR development activities, while its contribution to transforming employee competencies and work behavior remains less developed. This indicates that technology adoption alone is insufficient to ensure substantive HR development outcomes; such outcomes also depend on employees' self-directed learning and the organization's capacity to systematically evaluate learning impacts. Based on these findings, the organization should strengthen the self-directed learning culture, develop systematic mechanisms for evaluating the impact of digital learning on employee competencies and

performance, and enhance internal capabilities for utilizing employee data in HR development decision-making. These recommendations are directly derived from the identified constraints and the observed gap between improved delivery efficiency and still-developing outcome effectiveness.

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