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Digital HR, Employee Empowerment, Internal Mobility, Career Development on Knowledge Innovation, and Employee Engagement in Technology Firms in Indonesia

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ABSTRACT

Purpose of the study: This study aims to explore the relationships between Digital Human Resource Management, Employee Empowerment, Internal Mobility, Career Development, Knowledge Innovation, and Employee Engagement in Indonesian technology companies.

Methodology: A quantitative approach was used, collecting data from 675 employees via a structured questionnaire with a five-point Likert scale. The data were analyzed using Structural Equation Modeling with Partial Least Squares (SEM-PLS 3.0).

Main Findings: Digital HR directly influences Employee Empowerment and Internal Mobility, which positively affect Career Development. Career Development impacts Knowledge Innovation and Employee Engagement, with Knowledge Innovation serving as a mediator between Career Development and Engagement.

Novelty/Originality of this study: This study integrates Resource-Based View (RBV) and Social Exchange Theory (SET), demonstrating how Digital HR competencies and employee reciprocity drive innovation and engagement, providing insights for HR managers in technology firms to enhance talent development and competitiveness.

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1. INTRODUCTION

Digital HRM has revolutionized the manner in which companies recruit, develop, and retain workers in today's workplace. This is strongly applicable in the scenario of a knowledge economy, whereby technology companies are required to deal with human capital in an effective and innovative manner. The evolution from conventional HR practices to technology- and data-driven practices is currently a strategic imperative, and the adoption of artificial intelligence (AI), enterprise resource planning (ERP) systems, and electronic human resource management (e-HRM) systems exemplifies top-tier organizational effectiveness, adaptability, and competitiveness [1]-[3]. Not only does HR procedure digitization simplify administrative processes, but it is also a driving force of

strategic change to instill an adaptive and collaborative culture of work. Through AI-driven systems and performance analytics, organizations can establish objective recruitment and assessment processes alongside speeding up decision-making. In addition, activities of employee talent enhancement and skill development are simplified through the application of custom learning paths and data-based decision-making frameworks to enhance international competitiveness [4]-[6].

The phenomenon of Digital Human Resource Management (Digital HR) also explains the direction of this development, particularly in developing nations like Indonesia. Digital HR tools allow administrative tasks to be automated, improve the quality of decision-making via data, and improved employee work experiences with the convergence of technologies like AI and machine learning. Applications of web-based recruitment software, performance measuring via data, and career websites simplify it for organizations to align their human resource strategy with more organizational responsiveness and innovation. Digital HR is also relevant in employee empowerment through offering personalized learning and development centers in a way that individuals take control of their careers [7]-[9]. In addition to enhancing effectiveness, this technology establishes a more flexible work culture and increases employee engagement and satisfaction [10]-[12]. Empirical data in Indonesia show that AI-based digital HR practice significantly influences employee satisfaction and engagement, as well as solidifying knowledge innovation, culture of learning, and sustainable performance [13]-[15].

Indonesian tech companies are the growth drivers of Southeast Asia, with success depending on digital capability, resilience, and an innovative mindset among employees. Employee engagement, in this case, is a key driver that decides innovation, productivity, and organizational survival. Maintaining high engagement under conditions of accelerated technological change, however, is not an easy task. An obsolescence risk of skills, growing job sophistication, and continuously changing career ambitions call for a reactive HRM strategy. Therefore, recognizing how Digital HR contributes to engagement enhanced by empowerment, mobility within the organization, and knowledge innovation mechanisms is extremely strategic [16]-[19]. PT Telkom Indonesia Great People Development Program (GPDP) is a good example that proves strategic HR programs can empower employees while creating an integrity and high-performance culture. Employee empowerment is one of the most significant areas of HRM digital transformation.

This procedure is autonomous, is endowed with power, and has resources that grant the employee decision-making ability and an active role in organizational action. Empowerment is enhanced if accompanied by an electronic human resource management (e-HRM) system, as communication, learning, and feedback may be done openly and data-based [20]. E-HRM-based empowerment has been shown to enhance creativity, commitment, and productivity since it fosters a teamwork environment through connecting individual and organizational objectives [21]. Internal mobility, on the other hand, transferring employees between jobs or units, is one of the most important tools used to enhance career development and organizational responsiveness. Digital talent management systems enable such mobility through transparent competency maps and opportunities for careers [22], enabling organizations to create a flexible and continuous learning workforce. Along with empowerment and mobility, career development is still one of the most important drivers of employee engagement in the digital age.

Training, mentoring, and succession planning also enhance competencies and enable collective learning and innovation in knowledge the creation, dissemination, and adoption of new knowledge to enhance organizational performance [23]. Open and willing career development for younger generations like Generation Z is one key driver of retention and organizational commitment [24]. Thus, career development interventions tailored around personal goals and organizational strategic needs will lead to greater motivation and performance [25]. This research is theoretically grounded on two primary frameworks, namely the Resource-Based View (RBV) and Social Exchange Theory (SET).

RBV asserts that organizational knowledge and human capital are high-quality, high-value, and difficult-to-imitate assets that can create long-term competitive advantage [26]. In this context, Digital HR is a strategic facilitator that improves the building of human capital through the elevation of digital capability and adaptive capacity to fuel innovation [27]. At the same time, SET describes the reciprocity interaction between employee support and employee engagement [28], [29]. Where employees are empowered and provided with fair and open career support, they will then contribute with innovation and increased engagement [11]. The blending of these two theories offers a robust conceptual framework for realizing how digital HR practices, empowerment, in-mobility, and career development can enhance knowledge innovation and employees' commitment, especially for technology companies in Indonesia under global competition.

In addition to its strategic role in HR decision-making, Digital HR increasingly functions as an organizational learning infrastructure that embeds technology-enhanced learning within everyday work processes. Through integrated learning management systems, AI-driven learning recommendations, digital skill profiles, and data-driven feedback, Digital HR platforms orchestrate opportunities for lifelong learning, continuous upskilling, and reskilling of employees in response to rapid technological change. In technology firms, these systems not only standardize administrative HR processes but also provide a digital ecosystem in which employees can access

personalized learning pathways, micro-credentials, and collaborative knowledge-sharing spaces that progressively build their digital competence and innovation capacity.

However, existing research on Digital HR has predominantly examined its effects on administrative efficiency, talent management, and traditional HR outcomes such as turnover, satisfaction, or performance, while studies in the educational technology domain have largely focused on technology-enhanced learning in formal education settings rather than within organizations. As a result, there is still a limited understanding of how Digital HR, when conceptualized as organizational learning infrastructure, supports technology-enhanced learning in the workplace and translates into knowledge innovation and employee engagement, particularly in emerging economies. This study addresses this gap by investigating the role of Digital HR in enabling employee empowerment, internal mobility, and career development as mechanisms that foster lifelong learning, upskilling, and digital competence and, in turn, drive knowledge innovation and employee engagement in Indonesian technology firms.

Past research has largely addressed single dimensions of HR practices or focused on developed country contexts, and has rarely conceptualized Digital HR as technology-enhanced learning infrastructure that supports lifelong learning and upskilling in organizations. The current study thus aims to add theory by complementing our understanding of the role of digital HR in affecting knowledge innovation and employee engagement through empowerment, internal mobility, and career development as mediating effects. In reality, the findings of the study are likely to yield evidence-informed recommendations for HR leaders to create end-to-end digital strategies that can fortify empowerment, enable mobility, and give career development to drive engagement and sustainable competitive edge in the digital age.

Specifically, this study offers several novel contributions and addresses an urgent practical need. First, it conceptualizes Digital HR as an organizational learning infrastructure that enables technology-enhanced learning in the workplace and empirically links it to employee empowerment, internal mobility, career development, knowledge innovation, and employee engagement within a single integrative model grounded in RBV and SET. Second, it extends prior Digital HR and educational technology research by examining the mediating roles of empowerment, internal mobility, and knowledge innovation in explaining how Digital HR and career development translate into higher levels of engagement. Third, it responds to the pressing need of Indonesian technology firms to sustain innovation and employee engagement amid rapid digitalization, AI adoption, and skill obsolescence by providing context-specific, evidence-based insights on how Digital HR can be leveraged to support lifelong learning, upskilling, and the development of digital competencies in emerging-economy settings.

2. THE COMPREHENSIVE THEORETICAL BASIS

2.1. Resource-Based View

Barney [26] Resource-Based View (RBV) asserts that sustainable competitive advantage can only be achieved when an organization possesses and leverages resources that have four attributes: valuable, rare, inimitable, and non-substitutable (VRIN). Human resources, particularly knowledge, skills, and innovative capabilities, are seen to be strategic assets that meet all these conditions. The competitiveness of modern organizations is increasingly no longer in terms of the dominance of physical or financial assets but the ability to generate and manage innovative, high-value, and difficult-to-imitate human capital. The digital age of transformation is where Digital Human Resource Management (Digital HR) is a strategic enabler that facilitates the optimization of human capital by merging technology-based systems and data analytics. As in accordance with Noe [30] and Abdulrahman [31], the ability of a firm to harness technology to create human capital is the key to lasting competitive advantage. Technology applications to automate HR processes recruitment, training, performance appraisal, and talent management not only simplify administrative work but also promote efficiency in operations and provide strategic insight for adaptive data-driven decision-making [32].

From an RBV perspective, knowledge and learning capabilities constitute a central class of strategic resources. It is not only the stock of human capital that matters, but also the organization’s ability to continuously create, absorb, and recombine knowledge through learning processes. In this sense, Digital HR serves as a technology-enabled infrastructure that structures access to training, reskilling, career development, and knowledge-sharing platforms, thereby strengthening the firm’s organizational learning capability. This positions knowledge not merely as an input, but as a learning asset that is continuously renewed through technology-enhanced learning activities in the workplace.

Thus, Digital HR progresses from being an elementary operational tool to being a strategic asset that creates business agility, innovation, and competitiveness in the digital economy. Furthermore, RBV also explains how the forces of employee empowerment, internal mobility, and career development play a crucial role in enriching the value of an organization's human capital and uniqueness. Employee empowerment allows workers to be more autonomous and responsible in making decisions, hence inspiring creativity, intrinsic motivation, and innovative problem-solving abilities [33] . Internal mobility serves as a tool for cross-departmental learning and

sharing that increases organizational flexibility and consolidates the ability to react to changes in the marketplace [31], while career development ensures equilibrium between individual aspirations and organizational strategic goals through training and continuing learning programs. The interaction among these three dimensions boosts knowledge innovation as an essential organizational capability, i.e., the ability to continuously create, disseminate, and deploy new knowledge. Thus, RBV provides a strong conceptual framework for understanding how Digital HR through empowerment, mobility, and career development functions as an engine for improving human capital as a basis of long-lasting competitive advantage in knowledge economies.

Thus, RBV provides a useful lens for understanding how Digital HR and related practices (empowerment, internal mobility, and career development) build and mobilize learning assets, which in turn underpin knowledge innovation and sustained competitive advantage in knowledge-intensive technology firms.

2.2. Social Exchange Theory (SET)

Social Exchange Theory (SET), originated by Blau [34], propounds that social relations between individuals and organizations are formed on the principle of reciprocity under which both exchange according to how much they receive. In modern-day organizations, this theory holds that if employees feel that they are being supported, treated fairly, and valued by the organization either through empowerment, career development opportunities, or an open Digital HR system they will, in turn, show positive behaviors such as loyalty, commitment, and high engagement [35], [36]. This mutual positive association is conducive to the evolution of Perceived Organizational Support (POS), where the employee perceives that the organization values their inputs and cares about their well-being [37]. Since the employees feel that social relations are fair and supportive, they create a moral commitment to repay such trust in terms of commitment, best performance, and innovative behavior that sustains the success of the organization [7]. Employee engagement thus can be understood as a psychological and emotional response towards social investment and concern of the organization in the shape of trust- and reward-based HR practices.

Within the SET framework, learning opportunities and developmental support provided by the organization (e.g., training, mentoring, digital learning platforms, and career development programs) can be viewed as salient forms of relational investment. When employees perceive that the organization invests in their continuous learning and skill enhancement, they feel obliged to reciprocate by engaging in learning behaviors, sharing knowledge with colleagues, and contributing innovative ideas. This “learning reciprocity” process links Digital HR-enabled development practices to higher levels of employee engagement, as employees return organizational support with increased cognitive, emotional, and behavioral involvement in their work.

Digitalization of human resource management embodies this social exchange mechanism with even more participative, transparent, and equitable mechanisms. Digital HR platforms provide employees with greater access to information, training, and career opportunities, hence improving their autonomy, competence, and mastery of their own development [37], [38]. Technology-facilitated empowerment creates a feeling of an inclusive work environment and promotes a feeling of organizational justice, two important determinants that foster trust and emotional commitment among employees and the organization [35].

In this case, practices like employee empowerment, internal mobility, and career growth facilitated through digital systems not only increase the effectiveness of administration but also increase the extent of social relations in the workplace. Besides, knowledge innovation would be the tangible result of healthy social interaction, where esteemed employees are more likely to share ideas and work together both horizontally and vertically [39]. Therefore, knowledge innovation and participation are not only consequences of the launch of successful digital HR systems but are phenomena of social exchange relationships based on mutual trust, support, and shared commitment among employees and organizations. Accordingly, SET explains how Digital HR and technology-enhanced learning practices foster a cycle of reciprocity around learning and knowledge sharing, in which organizational support for employee development is reciprocated through stronger engagement and knowledge innovation.

2.3. Hypothesis Development

Based on the theoretical framework and empirical evidence discussed earlier, this section develops the research hypotheses that explain the relationships among the key constructs, as illustrated in Figure 1.

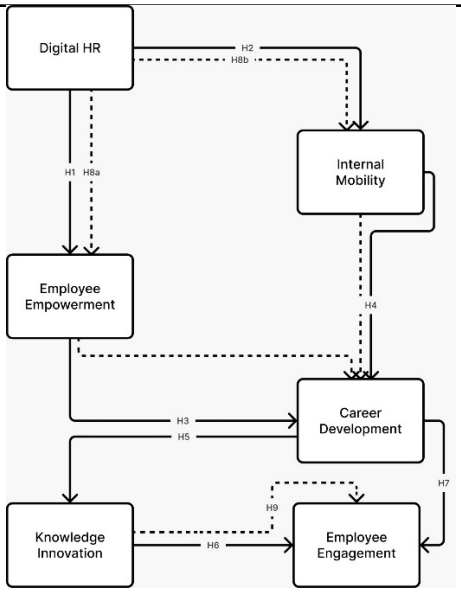

Figure 1. Conceptual Hypothesis

2.3.1 The Influence of Digital HR on Employee Empowerment

The Digital Human Resource Management (Digital HR) has changed the role of HR from an administrative to a strategic system possessing autonomy, efficiency, and decision-making based on data. Workers are enabled with direct access to real-time data, performance feedback, and tailored development opportunities through artificial intelligence (AI)-based analytics, e-learning sites, and self-service facilities. These computer systems decentralize power, facilitate participation, and enable workers to plan their work goals and monitor progress independently of their managers. These changes not only improve administrative efficiency but also improve the psychological dimension of worker empowerment by fostering confidence, autonomy, and meaning in work. In line with the views of [40] and [41], digital HR systems drive perceptions of fairness, transparency, and control of work that, in response, cultivates worker initiative, creativity, and motivation to deliver organizational value.

The use of advanced technologies such as cloud-based HRIS, human resource analytics software, and self-service portals has enabled digital HR to become a strategic partner in organizational transformation. These technologies enable automation of backroom work, precision in AI-based hiring, and efficiency in performance appraisal [42], [43]. As millennial and Gen Z demand for fast, nimble, and self-service work systems increases, HR digitalization facilitates a more immersive and inclusive experience of employees. Research finds that digital HR technology increases the sense of satisfaction, engagement, and ownership among employees in the company, while turnover is reduced, especially in environments involving remote work [44]. However, successful implementation also depends on the organization's ability to overcome challenges such as data safety, digital competency gaps, and resistance to change [45]. Accordingly, those organizations that can successfully leverage digital HR not only build structural effectiveness but also an adaptive and enabling organizational environment in which employees are actively engaged in determining their role towards the company's strategic goals.

H1: Digital HR positively influences Employee Empowerment.

2.3.2 The Influence of Digital HR on Internal Mobility

Digital HR transformation has also been central to the strengthening of internal mobility, or the ability of an organization to reassign employees from one department, function, or level of job to another. Digital HR platforms bring together competency information, career history, and employee career aspirations to offer a more objective and data-driven process of talent matching of internal candidates for vacant positions. Artificial intelligence (AI) and machine learning-based systems provide efficient, fair, and transparent internal selection mechanisms, accelerating promotions, job rotation, and transfers between work units. Not only does the system strengthen the talent allocation mechanisms, but it also supports employees' trust and loyalty through open career development opportunities [41]. Empirically, the use of digital talent management systems has been shown to reduce reliance on costly external recruitment, increase retention rates, and expand in-house career development options that are aligned with organizational strategy.

Moreover, the benefits of digital HR towards internal mobility include improved talent placement efficiency, competency-oriented promotion optimization, and organizational knowledge preservation. Cloud digital platforms enable accurate mapping of job requirements and employee skill and desire, so a more inclusive and responsive career environment can be realized [45]-[47]. From a Resource-Based View (RBV) perspective,

internal mobility helps to maintain high-value and inimitable firm-specific knowledge, thus a sustainable competitive advantage [48]-[51]. Alternatively, from the Social Exchange Theory (SET) perspective, internal mobility opportunities represent employees' trust within the organization and motivate reciprocity in terms of loyalty and long-term commitment [42]. Skill-based mobility has been discovered to be more efficient compared to the traditional hierarchical advancements because it encourages cross-functional collaboration and continuous innovation. By providing structured career pathways supported with state-of-the-art technology, organizations not only improve retention and employee satisfaction but also reinforce a culture of learning and strategic flexibility, which are the building blocks of digital era long-term competitiveness [45], [53].
H2: Digital HR positively influences Internal Mobility.

2.3.3 The Influence of Employee Empowerment on Career Development

Employee empowerment reflects the extent to which individuals feel they have autonomy, competence, and decision control in the workplace. People who are trusted and have the freedom to initiate are more likely to demonstrate increased intrinsic motivation, self-efficacy, and self-development commitment. Psychological empowerment includes four central dimensions meaning, competence, self-determination, and impact that act as mediators of job characteristics and intrinsic motivation [54]-[56]. Meeting these basic psychological needs consolidates work motivation and continuous learning orientation, leading to individual career development. Empowerment functions as an adaptive mechanism in a dynamic and competitive environment, inspiring employees to be proactively involved in their careers, expand their skills, and adapt to technology and organizational advancements. Therefore, empowerment impacts higher performance and satisfaction and increases career orientation in the long term, as well as learning and professional autonomy.

Empowerment is applied strategically in technology-based corporate organizations to promote psychological ownership of organizations and careers. Employees given autonomy to decide and conduct projects independently gain experiential learning that advances competency development and career readiness [57]. An empowerment workplace encourages innovative and collaborative behavior since employees perceive that they are responsible and are in control of the output of their work [24], [58]. Human resource practices such as autonomy at work, participation in decision making, and transparent systems of feedback have been seen to cultivate commitment, loyalty, and self-development orientation [47]. However, empowerment success is highly contingent upon organizational cultural support and the quality of open communication. Resistance to change, trust gaps, or differences in character may all impact how much employees can take advantage of opportunities for empowerment [60]-[62]. Therefore, empowerment is not merely a psychological condition, but rather a managerial style turning individual potential into lasting career growth and tangible contributions to organizational performance.
H3: Employee Empowerment positively influences Career Development.

2.3.4 The Influence of Internal Mobility on Career Development

Internal mobility is a strategic lever that fuels worker career development through inter-functional experience and growing organizational expertise. Through job rotation, laterals, and working on inter-departmental projects, workers can learn new skills, build professional connections, and increase career capital. This mobility process not only strengthens individuals' adaptive capabilities to changes in the work setting but also builds a more flexible, innovative, and learning-oriented workforce. Empirical evidence shows that participation in internal mobility programs profoundly increases job satisfaction and self-assessment of career advancement [63], [64]. In the process of digitalization, Digital HR Systems play an important role in making the potential of internal mobility more efficient through the provision of transparent access to internal career opportunities, competency maps, and career paths mapped according to the employee aspirations. Embedding this technology facilitates both organizational strategic goals and individual development needs, aligning with each other and hence creating a two-way fit between organizational performance and employee career growth.

Organizationally, internal mobility impacts strategy in three main areas: competency development, talent management, and cost savings. Internal mobility helps workers gain cross-functional experience that maximizes innovation and creativity, as done by global companies such as Accenture and MassMutual Financial Group, whose organizations shifted to a skill-based mobility model in order to replace traditional hierarchical promotions [49]. Second, as internal mobility has been proven to increase employee satisfaction and commitment, Hungarian research shows that 74% of the interviewees are sure that internal job shifts would reduce the risk of burnout and that 81.7% prefer electronic mobility programs [63]. Third, internal mobility increases organizational performance by maximizing existing talent, reducing external recruiting expenses, and guaranteeing organizational knowledge continuity. Information technology systems such as ADNOC Fursa are a case in point, enabling timely and open transfers between departments to fill gaps, improving cross-team collaboration, and increasing productivity [45]. However, success with internal mobility is dependent on equity, preparedness of organizational culture, and harmony with intrinsic employee motivation [65], [66] . With the support of an active and open digital HR system,

not only do organizations accelerate individual career development, but also build resilience and strategic responsiveness, which are the foundations of long-term competitiveness in the modern labor market.
H4: Internal Mobility positively influences Career Development.

2.3.5 The Influence of Career Development on Knowledge Innovation

Career development plays a significant role in building a culture of lifelong learning and skills development, the basis for knowledge innovation within an organization. Employees, through formal career development programs, mentoring, and training programs, have an opportunity to broaden their horizons and improve their competencies as per the needs of the industry. This not only strengthens technical expertise but also allows for knowledge transfer and creation of new knowledge, which is an organizational creativity driver. Research suggests that systematic career development has a positive relationship with knowledge sharing, motivation, and trying new ideas, as employees feel valued and have career advancement opportunities in sight [67], [68]. Training and development programs have also been shown to improve digital capability, positive work attitudes, and intrinsic motivation that cumulatively enable an innovative culture in the face of global competition [69]. Successful career development is thus an important channel for organizations to cultivate adaptive, innovative human resources that are ready to face technological change.

Psychologically, career satisfaction and affective commitment have strong relations with employees' innovative behavior. Employees, when they feel organizational support and see a clear career development path, are inclined to put intellectual efforts into solving complex problems and developing value-added innovative solutions [70]. The synergy of mentoring and training as a transformational mechanism strengthens career self-efficacy and provokes the cultivation of meta-capacity, or the ability of individuals to assume responsibility for and regulate their own careers [71], [72]. Through this cultivated ability, employees become proactive learners who enable knowledge accumulation and knowledge dissemination within the organization. With the assistance of a digital HR system that provides access to adaptive learning and personalized career paths, organizations not only enhance employee loyalty and satisfaction but also encourage a cycle of continuous innovation. Career development is thus a strategic link between individual development and collective innovation, and human resources emerge as a knowledge asset with a lasting contribution to organizational competitiveness in the digital age.
H5: Career Development positively influences Knowledge Innovation.

2.3.6 The Influence of Knowledge Innovation on Employee Engagement

Knowledge innovation helps enhance employees' sense of purpose and identification with the company. As employees are involved in the process of creating and implementing new concepts, not only do they reap career recognition, but also experience more holistic job satisfaction. Such involvement enhances their emotional attachment and mental engagement with the organization's common goals [73], [74]. Based on this, employee engagement has proved to be a source of innovation, as talented employees who have room for creativity are likely to produce something of value. Examples can be seen in organizations such as IBM, Apple, and Google, which have successfully made employee engagement the foundation of their innovative culture, hence the competitiveness and company performance [75], [76]. In this case, knowledge innovation is not a process that is merely technical, but also social that reinforces cooperation, commitment, and shared ownership of the company vision.

Besides, intellectual commitment and emotional investment by employees typically contribute significantly towards creating an organizational culture aimed at sustainable innovation. When values of an organization and individuals' personal values match, as is typically established in socially responsible HRM practices, work engagement is fostered and encourages innovative behavior [77]. An innovative culture leads to a working environment that is supportive of creativity, cooperation, and open exchange of ideas, thereby increasing knowledge creation and dissemination [78], [79]. Knowledge management in such an environment takes on the strategic function of bridging employee ideas with innovations' implementation that is beneficial to the firm. Therefore, companies that continuously promote knowledge innovation tend to have high levels of employee commitment and passion, ultimately creating stronger competitive strength and sustainability in the company.
H6: Knowledge Innovation positively influences Employee Engagement.

2.3.7 The Influence of Career Development on Employee Engagement

Career development is the fundamental process that creates a culture of continuous learning and building competencies, on which knowledge innovation in an organization is built. By means of training interventions, mentoring, and systematic career development programs, not only do employees develop their competencies, but they are also engaged in the process of knowledge sharing and conversion, which increases the capacity of the organization to manage change. Structured career guidance is positively related to knowledge-sharing willingness and the inclination to test out new things since workers are more driven when they perceive actual opportunities for advancement and reward for their efforts [70], [79]. Training programs also work towards developing technical

skills, creating favorable work attitudes, and fostering intrinsic motivation all ingredients pivotal to the development of a culture of innovation in the context of global competition [80]. On this count, career development is the propellant that helps translate individual learning to collective knowledge-based excellence.

From a psychological and organizational perspective, affective commitment and career satisfaction are critical to innovative behavior and worker motivation. Provided that the worker is able to view that their career path is open and the organization is always backing them, they gain intellectual motivation to engage intellectual forces in creating innovative solutions and solving intricate problems [70]. On the other hand, training and mentoring regimes are the process of change that develop career self-efficacy and shape metacapacity, which is the ability of individuals to take active charge and exercise control over their career development [71], [72]. Cross-functional teamwork promoted by respect for one another and open communication from mentoring relationships constructs cross-functional cohesion, speeds up the transfer of knowledge, and triggers innovative ideas. As companies get involved in encouraging learning and exploring careers, their workers become knowledge agents: independent learners who increase the firm's intellectual capital. Successful career development, therefore, not only increases personal satisfaction and engagement but also increases the capability of the company to innovate and compete more successfully in the digital economy.

H7: Career Development positively influences Employee Engagement.

2.3.3 The Mediating Role of Employee Empowerment on Internal Mobility

Consistent with H1–H4 results, the study affirms the reality that employee empowerment and internal mobility are the major intervening processes that integrate Digital Human Resource Management (Digital HR) and career growth. Digital HR platforms are not only technology systems, but rather a strategic infrastructure that impacts two important factors in human resource growth the psychological freedom through empowerment and structural chances through internal mobility. Digitization of activities such as recruitment, performance review, and training opens up space for people to direct their own careers, and mobility initiatives in an organization ensure organizational flexibility in mobilizing talent in positions that align with individual capability and desires [33], [67]. Therefore, digital HR plays a dual role: that of a technology driver facilitating higher efficiency and transparency, and that of a behavioral driver strengthening the connection between individual competencies and organizational strategy. This change means that digitization is not only an operational innovation but also a human capital investment that supports adaptive learning and continuous career advancement.

By means of digital HR platforms, in the empowerment context, authority and ownership of workers over their professional development are expanded via self-service portals, immediate feedback systems, and AI-based analytics that enhance psychological empowerment [41]. Career decisions are facilitated using this technology on a data-driven basis, whereas e-learning platforms and mobile HR apps enable personal and adaptive learning [83]. On the other hand, HR digitalization facilitates internal mobility by automating job rotation, internal recruitment, and skills matching activities by HRIS and cloud technology [84]. The success of this mediation, however, depends on the organization's readiness to surmount challenges in implementation, such as data security, cultural resistance, and digital illiteracy among HR practitioners [85]. Where mature digital integration takes place, empirical evidence shows that empowerment strengthens workers' psychological autonomy, and internal mobility enhances career opportunities based on competence. Synergistic integration of these two characteristics makes the connection between digital HR and career development indirect but significant through increased personal control and structural access to long-term career development [82].

H8a: Employee Empowerment mediate the relationship between Digital HR and Career Development.

H8b: Internal Mobility mediate the relationship between Digital HR and Career Development.

2.3.3 The Mediating Role of Knowledge Innovation

Knowledge innovation is an essential mediator of career development and employee engagement because learning and strengthening processes learned through career development programs directly promote workers' critical thinking, creativity, and innovative tendency. With training, coaching, and project-based innovation, employees develop new capabilities that enhance the firm's capacity to handle technological and market changes [86], [87]. These skills enable them to develop more flexible solutions to business issues while facilitating the company's continuous renewal. Lifelong learning initiatives also facilitate employees' responsiveness and responsiveness to the virtual business's dynamics [88], based on the concept of new human capital, which is oriented toward the importance of knowledge and skill development as strategic drivers for competitive advantage [77]. As a result, knowledge innovation is not only the product of organizational expenditure in career development, but also a means through which employees can showcase their involvement and innovative contributions to the organization.

As Social Exchange Theory (SET) states, knowledge innovation is a quid pro quo between employees and organizations in which corporate investment in career development creates a sense of moral duty and emotional commitment to stimulate innovation [89]. High-Commitment Work Systems (HCWS) and the quality of Leader–Member Exchange/LMX relationships (LMX) play important roles in fostering greater creativity,

loyalty, and motivation [90]. When companies develop learning communities through innovation workshops, cross-functional projects, and technology-enhanced training employees are encouraged to actualize their creative possibilities, creating increased affective and cognitive involvement [91]. From the Resource-Based View (RBV) perspective, innovation of knowledge increases an organization's intellectual capital, while from the SET theory perspective, employees' creative labor is a form of reciprocity for assistance from the firm. Innovation thus serves as a dynamic relationship between career growth and employee loyalty tying cognitive improvement with emotional attachment, enhancing innovative culture and organizational longevity in the new digital economy.

H9: Knowledge Innovation mediates the relationship between Career Development and Employee Engagement

3. RESEARCH METHOD

3.1. Research Design

This study adopts a causal-explanatory quantitative approach with the aim of testing for cause-and-effect relationships among variables based on a given theoretical model. This approach seeks to apply each construct empirically through analytical methods of structural modeling aimed at determining the suitability of the model with field information. The quantitative approach was used because it is capable of measuring things objectively using statistical tools and provides accuracy on the direction of the relationship between the variables under study. Information for research was collected by sending structured questionnaires, both offline and online, to employees of medium and large technology companies that have implemented a Digital Human Resource Management (Digital HR) system and established a knowledge-based organizational culture. Structural Equation Modeling–Partial Least Squares (SEM-PLS) data analysis technique was used to verify the measurement model's validity and reliability and the causal relationships between variables within the structural model.

The population for this study included employees of various tech-based companies in Indonesia, for instance, software developers, online service providers, IT consultants, and digital transformation start-ups. This population possesses the key characteristics of high digital literacy, culture of learning, and work system orientated towards innovation and technological flexibility. Data was collected from February to August 2025 using an online survey distributed on various platforms such as WhatsApp, Telegram, and LinkedIn, and also directly to the respondents in the Java region. The questionnaire in the survey was split into two parts: demographic information such as age, gender, level of education, position at work, and number of years of service in the first part, and six constructs with a five-point Likert type scale (strongly disagree = 1 to strongly agree = 5) in the second part.

Before being disseminated widely, the research instrument was pilot-tested by three researchers and two human resource practitioners to ascertain that it was understandable, context-relevant, and culturally sensitive. Pilot testing of 50 respondents had a Cronbach's Alpha of over 0.70 for all variables, which was an indicator of having very good internal consistency. 700 questionnaires were distributed and 675 returned with full and usable information according to Hair et al. [92] ten times rule proposing a minimum sample size of ten times the largest indicator in the model to ensure statistical power for SEM-PLS analysis. They were selected by purposive sampling on the basis of the following characteristics: (1) having one or more years of work experience with a tech firm, (2) having experienced or worked with a Digital HR system, and (3) holding a staff, supervisor, or manager level position. This ensured that data obtained was a true reflection of the experience of employees with digital transformation at the workplace.

Table 1. Sample Demographic

Profile Variable	Category	N	Percentag
Gender	Male	380	56.3%
	Female	295	43.7%
Age Group (Years)	21–25	85	12.6%
	26–30	215	31.9%
	31–35	200	29.6%
	36–40	110	16.3%
	Above 40	65	9.6%
Education Level	Diploma	35	5.2%
	Bachelor’s Degree	470	69.6%
	Master’s Degree	170	25.2%
Length of Employment	< 1 year	45	6.7%
	1–3 years	200	29.6%
	4–7 years	265	39.3%
	> 7 years	165	24.4%
Job Position	Staff / Officer	290	42.9%

	Supervisor / Coordinator	160	23.7%
	Manager	150	22.2%
	Senior / Director Level	75	11.1%
Industry Subsector	Software Development	255	37.8%
	IT Consulting	130	19.3%
	Digital Marketing & E-commerce	180	26.7%
	Start-up and Innovation Labs	110	16.3%

Source: Results processed by author's (2025)

The demographic description outcomes show that participants of this study were predominantly male employees (56.3%), as opposed to females totaling 43.7%, with a relatively balanced participation of both male and female genders in the technology industry. Based on age, the majority of the respondents fall within 26–35 years (61.5%), demonstrating the predominance of the young generation who are engaged with digital transformation in the workplace. Educationally, most of the respondents had a bachelor's degree (69.6%), followed by a master's degree (25.2%), indicating that the workforce in this sector has good educational qualifications. The greatest percentage of years of service was in the 4–7 years category (39.3%), which indicates sufficient work experience to understand digital HR practices. By occupation, staff and supervisor positions were dominant at 66.6%, which means the data were collected from directly involved individuals in the operation and implementation of digital HR systems. Compared to industry subsectors, the majority of the respondents came from the software development sector (37.8%), followed by digital marketing and e-commerce (26.7%), indicating a significant number of sectors that are Indonesia's backbone digital economy.

3.2. Measurement of Variables

All measures in this study were assessed using reflective indicators adapted from existing scales in the human resource management (HRM) and organizational behavior literature, with contextual adaptations appropriate for the Indonesian technology industry's nature. The DHR variable was measured on the basis of five statements citing [93]-[97], and reflecting perceptions of the effectiveness, availability, transparency, and usefulness of digital HR platforms to facilitate data-driven HR effectiveness. The Employee Empowerment (EE) measure is made up of four items from [98]-[100], which measure the level of empowerment, confidence, and ability of employees to make decisions and actively participate via the e-HRM system. The Internal Mobility (IM) metric is measured by four indicators of [101]-[104], and it measures the attitudes of employees towards job rotation and cross-division promotion opportunities via online channels. The Career Development (CD) variable includes five items from [105]-[109] that identify the effectiveness of training, mentoring, digital certification, and continuous career planning to enable professional growth in the information technology field.

In addition, the Knowledge Innovation (KI) model utilizes four statements of [110]-[102], which captures idea generation, knowledge sharing, and innovation implementation activity in online collaboration. Lastly, the Employee Engagement (EEG) construct has five items of [103]-[106] to capture employees' energy, commitment, and emotional attachment to the job and organization. The items are measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) to ensure equal perceptions from the respondents for all constructs, and the mean (M) and standard deviation (SD) are calculated to describe the central tendency and variability of respondents' responses to every research variable.

Table 2. Descriptive Statistics

Construct	Number of Items	Mean (M)	Standard Deviation (SD)
Digital HR	5	4.21	0.64
Employee Empowerment	4	4.15	0.68
Internal Mobility	4	4.09	0.70
Career Development	5	4.23	0.61
Knowledge Innovation	4	4.12	0.66
Employee Engagement	5	4.18	0.63

Source: Results processed by author's (2025)

From the descriptive analysis result in Table 2, all the research variables have a mean score higher than 4.00 with a relatively small standard deviation, indicating that most of the respondents have a positive and stable opinion towards the implementation of digital human resource practices in Indonesian technology companies. The Career Development variable was recorded the highest mean score (M = 4.23; SD = 0.61), indicating that employees view the career development and training provided by the company as excellent. The Digital HR variable (M = 4.21; SD = 0.64) indicates how effectively and transparently the digital HR system supports data-driven decision-making. Moreover, Employee Empowerment (M = 4.15; SD = 0.68) and Internal Mobility (M = 4.09; SD = 0.70) reflect a culture where there is trust with autonomy and equitable mobility opportunities for employees. Contrarily, Knowledge Innovation (M = 4.12; SD = 0.66) and Employee Engagement (M = 4.18; SD

= 0.63) reflect employees freely exchanging ideas, mutually cooperating, and showing emotional commitment to the organization. Overall, these results confirm that technology companies in Indonesia have created a flexible, synergistic, and innovative working culture based on digitalization. 3.5 Data Analysis Approaches

Data analysis in the current research was conducted using SmartPLS 3.0 software through a two-stage approach, i.e., measurement model testing (outer model) and structural model testing (inner model).

The initial stage, measurement model testing, aimed to confirm whether each measure used had a reasonable level of reliability and validity. Reliability was determined through several indicators, including factor loads above 0.70 as the criteria for practicality, along with Cronbach's Alpha and Composite Reliability (CR) values which are set to be greater than 0.70 to indicate good internal consistency. In contrast, convergent validity is measured through Average Variance Extracted (AVE) with at least a requirement of 0.50, while discriminant validity is examined through the Fornell–Larcker criteria and the Heterotrait–Monotrait (HTMT) ratio, which must be below 0.85 for the constructs to be empirically different from one another. The second step is estimation of the structural model used to examine the causal relationships between the variables given the hypotheses derived.

The test is performed by considering different parameters, including path coefficient (β) to see the direction and strength of the relationship between constructs, and even the t-statistic and p-value values obtained by repeatedly bootstrapping 5,000 times to see the level of significance of the relationship. Also, the Coefficient of Determination (R^2) test determines the extent to which variance within the model is explained, and Effect Size (f^2) assesses the amount each independent variable impacts the dependent variable. Further, Predictive Relevance (Q^2) is blindfolded-tested in order to measure the overall predictive capability of the model. The results of the model testing were then interpreted using the guidelines of Hair et al. [117] so that the findings of the research were high in accuracy, strength, and validity.

4. RESULTS AND DISCUSSION

4.1. Measurement Model Evaluation (Outer Model)

The measurement model utilized in this study was tested using the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique through SmartPLS 3.0 software to test the validity and reliability of indicators before hypothesis testing.

This step is designed to ensure all constructs Digital HR (DHR), Employee Empowerment (EE), Internal Mobility (IM), Career Development (CD), Knowledge Innovation (KI), and Employee Engagement (EEG) are properly represented by respective observed variables. Measurement model evaluation includes four general categories, i.e., indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Indicator reliability determines the extent to which every item may measure the underlying construct well, and a factor loading measurement of 0.70 or more is considered adequate, although between 0.60 to 0.70 measurements are also acceptable as long as overall reliability is high [102]. Furthermore, internal consistency reliability was also checked by Cronbach's Alpha (α) and Composite Reliability (CR), with a cut-off of more than 0.70 for both [77]. Convergent validity is established through the Average Variance Extracted (AVE), which must be greater than 0.50 to indicate congruence in variance for items measuring the same construct, while the likelihood of multicollinearity between the indicators is established through the Variance Inflation Factor (VIF) with the cut-off point set at less than 3.0 as a precaution, indicating no overlap between indicators and each variable contributing independently to its corresponding latent construct.

Table 3. Measurement Model

Construct	Indicator	Outer Loading	VIF	Cronbach's Alpha (α)	CR	AVE
Digital HR (DHR)	DHR1	0.831	2.115	0.881	0.921	0.686
	DHR2	0.844	2.232			
	DHR3	0.867	2.185			
	DHR4	0.781	1.952			
	DHR5	0.822	2.081			
Employee Empowerment (EE)	EE1	0.816	1.896	0.865	0.901	0.663
	EE2	0.842	2.054			
	EE3	0.798	1.761			
	EE4	0.852	2.226			
Internal Mobility (IM)	IM1	0.773	1.822	0.843	0.891	0.645
	IM2	0.826	2.096			
	IM3	0.801	1.931			
	IM4	0.843	2.167			

Construct	Indicator	Outer Loading	VIF	Cronbach's Alpha (α)	CR	AVE
Career Development (CD)	CD1	0.856	2.271	0.905	0.935	0.701
	CD2	0.862	2.386			
	CD3	0.826	2.053			
	CD4	0.882	2.411			
	CD5	0.844	2.166			
Knowledge Innovation (KI)	KI1	0.846	2.091	0.877	0.911	0.686
	KI2	0.811	1.945			
	KI3	0.863	2.172			
	KI4	0.836	2.016			
Employee Engagement (EEG)	EEG1	0.852	2.324	0.912	0.945	0.721
	EEG2	0.886	2.451			
	EEG3	0.842	2.286			
	EEG4	0.833	2.133			
	EEG5	0.876	2.391			

Source: Results processed by author's (2025)

The test of measurement model results in Table 3 show that the value of all indicators is higher than 0.70 for the outer loading value of 0.773 to 0.886, which means all the items can be representative of the latent construct strongly and consistently as Hair et al. [102] recommend that the value of loading factor higher than 0.70 reflects good indicator validity. The Variance Inflation Factor (VIF) for every indicator is also less than the 5.0 benchmark (ranging from 1.76 to 2.45), consistent with Hair et al. [72] guide that suggests no multicollinearity problems and demonstrates that every indicator contributes uniquely to the construct it represents. Thus, all the variables are deemed valid and worthy of further analysis as they show high strength and measurement stability.

Besides, the reliability test shows that all constructs meet highly satisfactory reliability measures with Cronbach's Alpha (α) values ranging from 0.843 to 0.912 and Composite Reliability (CR) ranging from 0.891 to 0.945, both exceeding the recommended minimum value of 0.70 by Hair et al. (2019) as an indicator of high internal consistency. The Average Variance Extracted (AVE) was also higher than 0.50 (range 0.645–0.721) for all the constructs, thus ensuring adequate convergent validity under which more than half of the indicator variance was accounted for by the latent construct. Overall, the findings from above ensure that the measurement model of the current study has met all the validity and reliability requirements by Hair et al. [102] such that the instruments used are considered capable to measure the constructs both with reliability and precision to accomplish the objective of the next stage of structural analysis.

Discriminant validity is used to ensure that all constructs in the model are clearly different from one another and that there is no conceptual overlap. Validity test was conducted using two significant criteria, namely the Fornell–Larcker criteria under which the square root of the Average Variance Extracted (AVE) for each factor should be higher than its correlation with other factors, and the Heterotrait–Monotrait (HTMT) ratio whose value should be less than 0.85 as stipulated by the threshold by [103]. These two standards were applied together in order to ensure that each construct was distinct and empirically representative concepts within the research model.

Table 4. Discriminant Validity

Fornell–Larcker Criterion						
Construct	DHR	EE	IM	CD	KI	EEG
Digital HR	0.821					
Employee Empowerment	0.612	0.814				
Internal Mobility	0.586	0.552	0.802			
Career Development	0.521	0.626	0.594	0.844		
Knowledge Innovation	0.503	0.543	0.477	0.682	0.828	
Employee Engagement	0.456	0.491	0.442	0.636	0.651	0.853
HTMT Ratio						
Construct	DHR	EE	IM	CD	KI	EEG
DHR						
EE	0.736					
IM	0.712	0.791				
CD	0.685	0.784	0.752			
KI	0.741	0.671	0.712	0.794		
EEG	0.794	0.728	0.693	0.688	0.743	

Source: Results processed by author's (2025)

Discriminant validity test results reported in Table 4 show that all constructs meet the Fornell–Larcker and HTMT criteria, which confirm that there are unique empirical differences among each of the model's variables. Based on the Fornell–Larcker criteria, each construct's square root of the Average Variance Extracted (AVE) (0.802–0.853) is higher than the correlation between other constructs, which suggests that indicators of each variable are measuring their own construct rather than other constructs. Also, results of the Heterotrait–Monotrait Ratio (HTMT) test show that all values are below the 0.85 cut-off recommended by Kline [108] i.e., 0.671 and 0.794. These results clearly show that there are no issues of multicollinearity among constructs, and every variable has a unique conceptual identity and can be distinguished from one another in the research model.

5.2 Structural Model Assessment (Inner Model)

After the measurement model was established to be valid and reliable, the next step was to evaluate the structural model (inner model) that reflects the causal relationships among the constructs as operationalized in the research framework. The evaluation was conducted by using SmartPLS 3.0 software with the bootstrapping technique of 5,000 subsamples to examine the significance of the hypothesized hypothesis paths. The analysis revolves around some important criteria such as collinearity of constructs through the Variance Inflation Factor (VIF) value, path coefficients (path coefficients β) and significance testing, Coefficient of Determination (R^2) value to obtain the percentage of explained variance, effect size (f^2) to note the contribution of each exogenous construct, predictive relevance (Q^2) to analyze the predictive strength of the model towards dependent variables, and the model fit indices as an indicator of the overall fit of the model with empirical data.

Before path relationships testing, multicollinearity was tested to ensure that independent variables were not very correlated with each other. In the case of all predictor constructs, Variance Inflation Factor (VIF) values were below 5.0, which ensured no serious problem of multicollinearity for the model.

Table 5. VIF Inner

Endogenous Construct	Predictor Variables	VIF Value
Employee Empowerment	Digital HR	2.423
Internal Mobility	Digital HR	2.366
Career Development	Employee Empowerment, Internal Mobility	2.481 / 2.533
Knowledge Innovation	Career Development	2.395
Employee Engagement	Career Development, Knowledge Innovation	2.571 / 2.445

Source: Results processed by author's (2025)

The results of the collinearity test for the structural model in Table 5 affirm that all the Variance Inflation Factor (VIF) values range from 2.366 to 2.571, which is still well below the cut-off value of 5.0 recommended by Hair et al. (2021). This indicates that there is no multicollinearity problem between constructs, whereby each independent variable has a unique contribution to the dependent variable being measured. Specifically, Digital HR has VIF values of 2.423 and 2.366 when it is a predictor of Employee Empowerment and Internal Mobility, and the combination of Employee Empowerment and Internal Mobility in Career Development has VIF values of 2.481 and 2.533, which are still tolerable. Similarly, Career Development and Knowledge Innovation as predictors of Employee Engagement also suffer from low VIF values, namely 2.571 and 2.445.

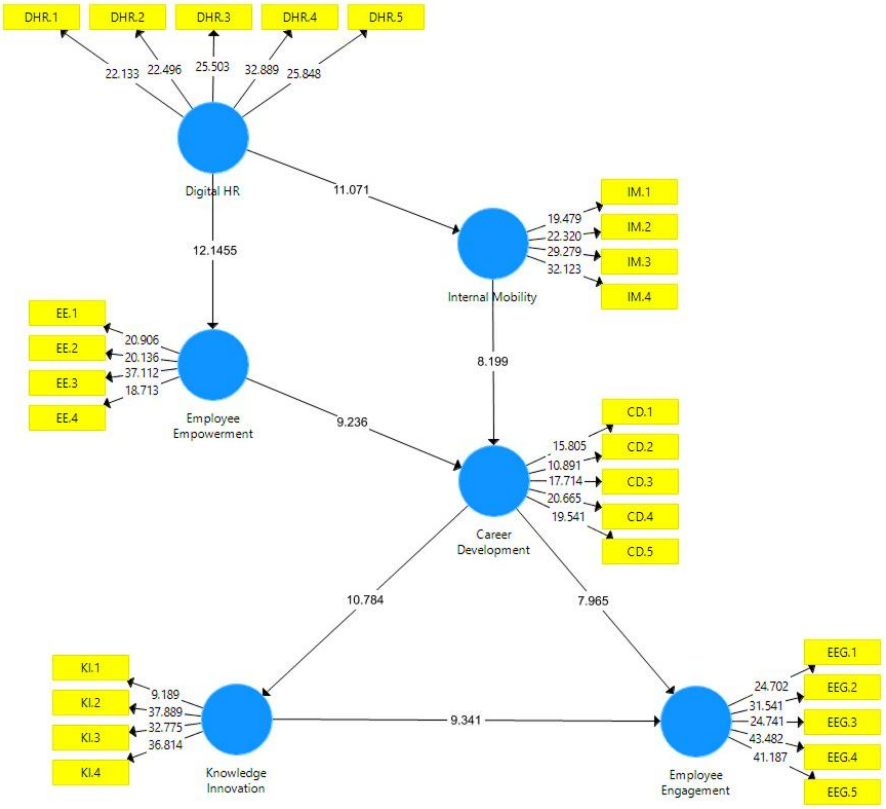

Figure 2. Structural Model
Source: Results processed by author's (2025)

The path coefficient (β) represents the direction and magnitude of relationships between constructs. The significance of each path was tested using the bootstrapping procedure (5,000 resamples, 95% confidence interval). The t-value of more than 1.96 ($p < 0.05$) is statistically significant.

Table 6. Bootstrapping Testing

	Path Relationship	Original Sample	t-value	p-value	Effect Size
	Direct Effect				
H1	Digital HR → Employee Empowerment	0.623	12.453	0.000	0.362
H2	Digital HR → Internal Mobility	0.586	11.071	0.000	0.334
H3	Employee Empowerment → Career Development	0.411	9.236	0.000	0.257
H4	Internal Mobility → Career Development	0.374	8.155	0.000	0.202
H5	Career Development → Knowledge Innovation	0.547	10.782	0.000	0.325
H6	Knowledge Innovation → Employee Engagement	0.492	9.341	0.000	0.277
H7	Career Development → Employee Engagement	0.355	7.965	0.000	0.222
	Indirect Effect				
H8a	Digital HR → Employee Empowerment → Career Development	0.331	6.990	0.000	0.146
H8b	Digital HR → Internal Mobility → Career Development	0.330	7.142	0.000	0.151
H9	Career Development → Knowledge Innovation → Employee Engagement	0.434	9.564	0.000	0.172

Source: Results processed by author's (2025)

The bootstrapping test results in Table 5 show that all paths between variables in the research model positively and significantly affect each other at a significance level of 0.001 ($p < 0.05$), as depicted by t-values far greater than the minimum threshold of 1.96. For direct effects, Digital HR has a great influence on Employee

Empowerment (OS = 0.623; t = 12.453; p = 0.000) and Internal Mobility (OS = 0.586; t = 11.071; p = 0.000), which indicates that a digital HR system can increase the degree of employee confidence, autonomy, and career freedom in a technology-supported working environment. Moreover, Employee Empowerment (OS = 0.411; t = 9.236; p = 0.000) and Internal Mobility (OS = 0.374; t = 8.155; p = 0.000) have a significant effect on Career Development, which means that empowerment and internal mobility are important factors to improve employee career development. In addition, Career Development has a positive influence on Knowledge Innovation (OS = 0.547; t = 10.782; p = 0.000), and both Knowledge Innovation (OS = 0.492; t = 9.341; p = 0.000) and Career Development (OS = 0.355; t = 7.965; p = 0.000) were found to contribute to Employee Engagement, indicating that knowledge innovation and definite career prospects can increase employees' affective bond and commitment to the organization.

For indirect relationships, the results also exhibit a significant mediating effect. The path Digital HR → Employee Empowerment & Internal Mobility → Career Development (OS = 0.331; t = 6.990; p = 0.000) and OS = 0.330, t = 7.142, p = 0.000) confirms that digital HR systems contribute to career development through improving employees' empowerment and mobility. Meanwhile, the Career Development → Knowledge Innovation → Employee Engagement (OS = 0.434; t = 9.564; p = 0.000) reveals that knowledge innovation is an effective mechanism that mediates the impact of career development on employee engagement.

The result of the effect size (f^2) test shows that the majority of the relationships between variables have a moderate to large effect, implying that the structural model has high explanatory power. The greatest impact is seen among the relation of Digital HR and Employee Empowerment ($f^2 = 0.362$) and Digital HR and Internal Mobility ($f^2 = 0.334$), showing the great contribution that digital HR systems play in facilitating employee empowerment and career flexibility. The path from Career Development to Knowledge Innovation ($f^2 = 0.325$) also shows a large impact, indicating the importance of career development in triggering knowledge-based innovation. Meanwhile, Employee Empowerment and Career Development ($f^2 = 0.257$), Internal Mobility and Career Development ($f^2 = 0.202$), Knowledge Innovation and Employee Engagement ($f^2 = 0.277$), and Career Development and Employee Engagement ($f^2 = 0.222$) share a moderate relationship, indicating that they are significant in driving engagement and career development. The mediating function of Digital HR in Career Development ($f^2 = 0.146$ and 0.151) and Career Development in Employee Engagement through Knowledge Innovation ($f^2 = 0.121$) has a moderate effect, indicating that empowerment and innovation are important mechanisms in improving employee engagement through digitalization of human resources.

The R^2 value describes the explanatory power of the model, i.e., the amount of variance in the endogenous variable that is explained by the predictor variable. According to [77], R^2 values of 0.25, 0.50, and 0.75 indicate weak, moderate, and high explanatory power, respectively. Meanwhile, predictive relevance (Q^2) is obtained according to the blindfolding process, where a Q^2 value greater than zero indicates that the model has predictive capability for the endogenous variable being considered. In addition, model fit is measured according to two important indicators, namely Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI), in order to identify to what extent the theoretical model aligns with the empirical data collected.

Table 7. R2, Q2 and Model Fit

Construct / Fit Index	R^2 Value	Interpretation (R^2)	Q^2 Value
Employee Empowerment	0.566	Moderate explanatory power	0.325
Internal Mobility	0.512	Moderate explanatory power	0.302
Career Development	0.634	Substantial explanatory power	0.386
Knowledge Innovation	0.576	Moderate explanatory power	0.351
Employee Engagement	0.691	Substantial explanatory power	0.403
Model Fit	Fit Index Value	Threshold	Model Fit Interpretation
	SRMR = 0.046	< 0.08	Good fit
	NFI = 0.91	> 0.90	Good fit
	RMS_θ = 0.098	< 0.12	Acceptable fit

Source: Results processed by author's (2025)

The structural model fit values generated in Table 6 show that the values of R^2 and Q^2 overall are in the substantial to moderate category, which means the model is able to explain and predict the dependent variables highly. The highest R^2 values belong to Employee Engagement (0.691) and Career Development (0.634) constructs, which indicate that more than 60% of the variance in both the variables is explained by the constructs influencing them, indicating the strong explanatory power of the model in explaining employee engagement and career development behavior in IT companies. Other constructs such as Employee Empowerment (0.566), Internal Mobility (0.512), and Knowledge Innovation (0.576) were in the moderate category, determining that these variables also play a considerable role in stimulating the dynamics of digital-based HR management.

Conversely, Q^2 values ranging between 0.302 and 0.403 demonstrate that the model is predictive in nature with good values for Employee Engagement (0.403) and Career Development (0.386), which indicates that the model can predict employee behavior and knowledge of career development and work engagement accurately. The overall model fit test results also indicate the reliability of the model, as SRMR = 0.046 (< 0.08) and NFI = 0.91 (> 0.90) indicate a good fit, and RMS_θ = 0.098 (< 0.12) is still in the range of acceptable fit. Thus, the combination of values for R^2, Q^2, and model fit indices verifies that the research model is empirically well-fitted, structurally highly valid, and highly predictive in describing the dynamic relationship between Digital HR, employee empowerment, internal mobility, knowledge innovation, and employee engagement within the Indonesian technology sector.

Empirical findings of this research confirm that all structural relationships in the structural model (H1–H9) are significant, verifying the conceptual model's validity bridging Digital HR, Employee Empowerment, Internal Mobility, and Career Development to Knowledge Innovation and Employee Engagement. These results validate the contention that digital change in human capital management is not only automation of administration, but organisational change that shapes organisational capabilities based on knowledge [119], [120]. Utilization of HR digital systems by Indonesian technology companies such as Telkom, Gojek, and Tokopedia also shows how HR analytics dashboards and cloud HR systems can improve transparency and efficiency and provide employees instant access to career paths and performance. This agrees with the view of Rana & Sharma [121] that the role of HR has evolved into a strategic business partner, rather than an administrative function. Thus, digital HR is now a strategic enabler that drives efficiency and innovation, substantiating the fact that technology-enabled HR systems have a strong impact on empowerment and internal mobility.

The impact of empowerment through digital HR is experienced in the office, especially in companies that adopt an agile workforce model and cross-functional collaboration. Through digital performance dashboards, employees are able to monitor personal achievement, participate in online training, and assist in fact-based decision-making. Such a mechanism is an elaboration on the tenets of Social Exchange Theory Blau [34] whereby organizational support and trust are reciprocated with strong commitment and loyalty on the part of employees. The electronic HR system modeled on e-HRM [122], [1123] also adds to engagement through room for open communication, prompt performance feedback, as well as enabling collaborative participation that fosters ownership and a feeling of responsibility. On the other hand, internal mobility is enabled through online talent platforms to facilitate job rotation and cross-functional promotions, such as the Telkom Indonesia Great People Development Program (GPDP) [124]. These findings confirm the hypothesis that digital HR fosters an empowering workplace and greater mobility opportunities and thus organizational agility when faced with digital disruption [49].

Moreover, analysis results show that Employee Empowerment and Internal Mobility directly affect Career Development. This accords with Matsuo [125] arguments that psychological empowerment strengthens individual confidence and autonomous effort at learning, which in turn promotes expedited career development. Trusted employees are likely to be proactive in getting training, setting career goals, and learning new skills. Internal mobility also helps in knowledge expansion and development of cross-functional learning cycles that enrich work experience [126]. These findings validate the Resource-Based View (RBV) model [19], [127] that synergy between empowerment and internal mobility produces intangible assets that are difficult to imitate—i.e., adaptive capabilities and innovative human capital. In evolving Indonesian technology companies, workers' autonomy to switch between departments and projects (for instance, from product management to software development) supports integrating knowledge that improves the competitiveness of the company in the global market [31], [32].

Another notable finding shows that Career Development has a considerable and positive impact on Knowledge Innovation. These results are a confirmation of Nonaka et al. [128] theory of knowledge creation since it proclaims individual learning to be the foundation for building collective organizational knowledge. Employees who undergo computer-based training and mentoring sessions show a higher tendency to share ideas and participate in innovation activities. In Indonesia, DANA and Traveloka have adopted a digital learning environment to improve talent-based innovation potential. This is in agreement with studies by Pramudita [114], who state that technology-facilitated career development can increase creativity and motivation. Moreover, from an RBV perspective, career development creates strategic value through the creation of intellectual capital and human capital that form the pillars of an organization's innovative capabilities [27]. These results also demonstrate the significance of a learning culture for shaping knowledge innovation in technology companies that experience fast product cycles and creativity as imperatives.

Mediation analysis of H8 and H9 provides deep insights into the mechanism behind inter-variable interactions. Internal empowerment and employee mobility are shown to mediate the impact of digital HR on career development, such that technological change functions as long as behavior change and organizational change are present alongside it. Digital HR provides a technical model that enhances transparency and autonomy, and mobility and empowerment are psychological and structural paths that transform digital capability into real career progression [41], [130] . On the other hand, Knowledge Innovation spans career growth and staff

involvement, illustrating that learning and application of fresh knowledge is a passage towards emotional attachment to the company [131], [132]. Workers who find their thoughts materialized see higher meaning in their work, in line with Kahn [76] models of involvement. The two theories, RBV and SET, explain this phenomenon complementarily: RBV explains the creation of strategic value by innovative human resources, and SET explains the psychological reciprocity mechanism between employees and organizations [35]. Hence, this study adds to HR digital transformation literature in developing nations by showing that the success of HR digitalization is not only defined by technology, but by social designs that foster empowerment, learning, and continuous innovation.

Theoretically, this research contributes significantly to the inclusion of HR digitalization within a tried-and-tested behavioral model. This research broadens the scope of the Resource-Based View (RBV) theory by connecting digital transformation with human capital development, and enriches the Social Exchange Theory (SET) by describing the mediating roles of empowerment and innovation in the HR practices-employee engagement process. Additionally, this research offers empirical support for the route of Digital Human Resource → Empowerment/Mobility → Career Development → Knowledge Innovation → Engagement, validating that digitalization of HR is an enabler in building sustainable engagement by developing an innovative culture in the workplace.

For practitioners, the findings of this study highlight the necessity of adopting a strategic digital HR system with emphasis on the autonomy, mobility, and development of workers. HR executives in technology companies must empower workers by leveraging the use of data-based feedback, open performance information, and participative decision-making. Furthermore, internal mobility can be fostered by designing clear career paths and cross-functional opportunities underpinned by digital platforms. Learning should also be combined with innovation, such that career development programs promote problem-solving, experimentation, and creative thinking. Employee motivation can be augmented through recognition programs that emphasize learning and innovation rewards that are consistent with career development. The use of these practices can heighten job satisfaction, decrease turnover, and create a strong and innovation-driven organization that can thrive with technological disruption.

Despite the strong findings of this research, there are a number of limitations to bear in mind. First, the data were collected in Indonesian technology firms, and thus the findings might not be entirely generalizable to other industries or nations. Second, the fact that cross-sectional data were used restricts the level of causal inferences that can be made. Thus, longitudinal design must be used in future research to control for dynamic change in employee engagement and innovation over time. Further analysis investigating the moderating effects of organizational culture, leadership style, and digital maturity will also serve to explain contextual differences in the HR digitalization-employee engagement relationship.

5. CONCLUSION

This study demonstrates that Digital HR plays a significant role in enhancing employee empowerment, internal mobility, and career development, which in turn foster knowledge innovation and employee engagement. The findings confirm that Digital HR functions not merely as an administrative tool but as a strategic enabler of organizational learning and adaptability. Consistent with the Resource-Based View and Social Exchange Theory, empowerment and digital HR practices serve as valuable organizational resources that promote reciprocal commitment, innovation, and performance. From a practical perspective, the results highlight the importance for organizations particularly in emerging economies such as Indonesia to strategically integrate Digital HR systems with empowerment initiatives, internal mobility, and structured career development. Such integration supports continuous learning, digital competence, and sustainable organizational growth. Future research is encouraged to adopt longitudinal or cross-contextual designs, incorporate additional organizational variables such as leadership style and digital maturity, and employ qualitative or mixed-method approaches to deepen understanding of how Digital HR facilitates learning, innovation, and engagement in dynamic work environments..

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the preparation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried **out** entirely by the authors without the assistance of AI-based technologies.

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