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Embedding Innovation and Technology in HR Practices and its Effects on Organizational Performance

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Abstract

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Purpose: This study shows how using innovation and technology in Human Resource (HR) practices can improve an organization's performance. It aims to understand how these tools help make HR processes more efficient and boost overall success.

Methods: The research used a survey to gather information from 404 employees in sectors such as banking, tourism, public health, education, and civil service. The survey was shared online, and the answers were analyzed using IBM SPSS and Amos software. Different statistical methods were used to find connections between innovation, technology, and organizational performance.

Results: The findings show that using innovation and technology in HR practices leads to better organizational performance. When innovation and technology are used together, they have the biggest positive impact, making processes more efficient and improving employee satisfaction.

Conclusion: Integrating innovation and technology into HR practices helps organizations improve their operations and keep employees happy. Organizations that use these tools are better able to stay competitive and grow. HR managers should focus on using these strategies to improve their processes and ensure long-term success.

Keywords: Innovation, Technology integration, Organizational performance, Human resource practices, Efficiency improvement

I. Introduction

In today's dynamic business environment, organizations must adapt to technological advancements and innovations, with Human Resources (HR) playing a crucial role in shaping company culture, managing talent, and enhancing performance (Akdere & Egan, 2020; Coetzee & Veldsman, 2022). The Fourth Industrial Revolution, characterized by digital technologies like automation and artificial intelligence, transformed HR functions such as recruitment, employee engagement, training, and performance management (Dwivedi et al., 2021; Oosthuizen, 2022). By incorporating these technologies, companies gain a competitive edge in attracting, developing, and retaining talent (Jemine & Pichault, 2023).

AI and data analytics make HR processes more efficient and data-driven, improving operations and increasing employee satisfaction through personalized HR services (Brown & Clark, 2019;

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Stasevych & Zvarych, 2023). Beyond technological shifts, modern HR strategies emphasize a culture of continuous learning, adaptability, and creativity to maintain competitiveness in a rapidly evolving workforce (Kraus et al., 2021; Porath, 2023).

Research indicates that integrating technology into HR practices positively impacts company performance by enhancing employee satisfaction, productivity, and success (Prejith & Kumar, 2022; Ezuma et al., 2019). AI-driven talent management and digital platforms for recruitment and training allow organizations to streamline their HR operations, positioning them for long-term success (Rožman et al., 2023; Faqihi & Miah, 2023; Bhatti et al., 2020).

In Nepal, there is growing interest in improving the performance of government, institutions, and federal structures through innovation and modern technology. This research focuses on how technology can enhance productivity and effectiveness, particularly in education and non-commercial sectors. By exploring new ways to manage human resources (HR), this study could help develop policies that align with Nepal's national goals and support sustainable growth across various sectors. While technology rapidly changes the business world, its impact on HR practices is unclear. This research aims to understand how innovation in HR affects organizational performance, including both the challenges and benefits of using modern technology to improve success in a competitive environment.

The study will collect data directly from respondents, but this could introduce potential employee biases. Additionally, the limited timeframe of the study may not capture long-term effects, and ongoing technological changes could make some findings less relevant in the future. Differences in the size of organizations across sectors may also affect the representativeness of the results, making them less applicable to every type of organization. Sector-specific results might not apply universally, as organizations have different structures, cultures, and challenges. Furthermore, regulations and compliance standards specific to each sector could limit the ability to adopt certain HR practices or technologies across all industries. Despite these limitations, this research could provide valuable insights for improving workforce management and boosting organizational performance in Nepal.

II. Reviews

In today's competitive business environment, organizational success relies on integrating innovation, technology, and HR practices. Theories like Human Capital, Innovation Diffusion, Social Exchange (SET), TAM, and Dynamic Capability explain how these elements boost performance. Seven hypotheses (H_1 - H_7) highlight their crucial role in enhancing organizational outcomes.

H_1 : Innovation-embedded organizational systems have a significant influence on organizational performance.

Human Capital Theory positions employees as key assets within organizations, and by investing in their development through training, learning opportunities, and career progression, businesses can improve their performance. This perspective aligns with H_1 , which suggests that embedding innovation into organizational systems fosters better outcomes. Rahmadhani et al. (2020) emphasize that organizations must continually develop their workforce to stay competitive. Similarly, Khaykin et al. (2020) highlight the importance of understanding and utilizing common and unique employee skills, allowing organizations to enhance team efficiency and productivity. Zhang et al. (2015) discuss the significance of measuring employee skills to optimize roles within the organization, further supporting the role of human capital in driving performance. Additionally, Nemeth (2017) and Nafukho et al. (2004) stress the importance of continuous learning for employees to remain competitive in rapidly changing markets, further validating the role of innovation-embedded systems in boosting organizational performance.

H_2 : Technology-embedded organizational systems have a significant effect on organizational performance.

The role of technology in enhancing organizational performance is well-supported in academic literature, with Rogers' (1995) Diffusion of Innovation (DOI) Theory offering a key framework for understanding how technological innovations are adopted within organizations. According to Roger, once new technologies are embraced, they become essential tools that improve efficiency and productivity, aligning with H₂, which posits that technology-embedded systems positively impact performance. Makovhololo and Batyashe (2017) and Miranda et al. (2016) illustrate how adopting technology improves operational efficiency across various sectors, such as enhancing competitive intelligence or streamlining complex processes. Bakkabulindi (2014) reinforces that organizational readiness for change and a supportive culture is vital for successful technology integration. These reviews demonstrate technology's crucial role in improving organizational outcomes by enhancing efficiency and adaptability.

H₃: Innovation and technology-embedded HR functional practices have a significant impact on organizational performance.

Integrating innovation and technology into HR practices significantly impacts organizational performance, as Social Exchange Theory (SET) explains. Hom et al. (2009) suggest that employees reciprocate organizational investments in innovative HR practices by improving their job performance. This supports H₃, posing that HR practices embedded with innovation and technology directly influence performance outcomes. Min et al. (1976) build on this by explaining that employee engagement with technologically enhanced HR systems, such as AI-driven talent management, is key to optimizing recruitment and retention efforts, ultimately improving organizational performance. Bhanumathi et al. (2023) also find that AI-based HR systems streamline workforce management and training, increasing efficiency and employee satisfaction. These studies demonstrate how HR practices contribute significantly to organizational success when supported by innovation and technology.

H₄: Innovation-embedded HR practices have a significant influence on innovation- and technology-embedded organizational systems.

The Technology Acceptance Model (TAM), introduced by Davis (1993), explains how employees accept and use new technologies. According to TAM, employees are more likely to adopt a technology if it is easy to use and beneficial to their work. This aligns with H₄, suggesting that innovation-embedded HR practices influence the success of technology-embedded systems.

Venkatesh and Davis (2000) expanded TAM to include social influence and facilitating conditions as key factors that affect employee adoption of technology. Legris et al. (2003) further argue that HR technologies must be perceived as valuable and user-friendly so that employees can engage with them effectively. DeLone and McLean (2003) take this further by linking the successful adoption of HR technology to broader organizational performance improvements, highlighting that HR practices focused on innovation positively influence the integration and success of technology-embedded systems.

H₅: Technology-embedded HR practices have a significant influence on innovation- and technology-embedded organizational systems.

Dynamic Capability Theory, as proposed by Teece et al. (1997), suggests that organizations with dynamic capabilities can sense and seize opportunities and reconfigure their resources to remain competitive. This theory supports H₅, which posits that technology-embedded HR practices influence innovation and technology-embedded systems within organizations.

Wang and Ahmed (2007) and Eisenhardt and Martin (2000) argue that dynamic capabilities help organizations align their HR practices with technological advancements. Borch and Madsen (2007) explain that adaptive HR systems facilitate innovation and technology integration across organizational functions, allowing organizations to stay flexible and respond to market changes. These studies demonstrate that technology-embedded HR practices are critical to maintaining innovation and integrating technology into broader organizational systems.

H₆: Innovation and technology-embedded HR practices mediate the relationship between innovation-embedded organizational systems and organizational performance.

SET explains that when organizations invest in innovative and technology-driven HR practices, employees reciprocate by engaging more fully with these innovations. This notion supports H₆, which suggests that HR practices mediate the relationship between innovation-embedded systems and organizational performance.

Beugre (1998) and Folger (1987) discuss the importance of fairness and transparency when implementing technological innovations. Employees are more likely to adopt new technologies when they perceive that the organization implements these changes equitably and beneficially. A case study from the Rome Business School (2019) demonstrates how AI-based HR systems reduced administrative burdens, increased employee engagement, and improved performance. These studies illustrate the mediating role of innovation and technology-embedded HR practices in linking organizational systems and performance.

H₇: Innovation and technology-embedded HR practices mediate the relationship between technology-embedded organizational systems and organizational performance.

TAM also supports H₇, which focuses on how HR practices mediate the relationship between technology-embedded systems and performance. Davis (1993) asserts that employee acceptance of technology is crucial for successful integration. HR practices that ease this transition, such as training and support, ensure that employees are more likely to engage with the technology, ultimately improving organizational performance. Rathee and Bhuntel (2022) provide evidence through case studies from TCS and HCL, where HR practices facilitated the integration of technology into organizational processes, leading to improved performance. DeLone and McLean (2003) also emphasize the importance of HR in fostering technology adoption, directly linking this to improvements in performance indicators such as system quality and information dissemination.

The conceptual framework outlines key factors that drive performance, such as strategic technology alignment, AI-driven HR practices, and innovation. It emphasizes digitalized processes, tech-enabled self-service, and work-life balance as essential parts of a technology-based system. These factors lead to data-driven decision-making, agile HR actions, and a tech-friendly work culture, resulting in better productivity, employee satisfaction, sustainable growth, and more vital branding. By aligning these practices, organizations can create a dynamic, adaptive environment that promotes long-term success.

III. Methodology

This study used a causal research design to explore how innovation and technology impact organizational performance. It examined how integrating these elements into HR practices influences success, aiming to identify patterns and relationships between variables and offering insights into the factors affecting organizational success. This study focused on employees from various sectors, including civil service, banking, tourism, public health, and education, who used innovation and technology in HR functions. Due to the unknown population size, a non-probability sampling approach was used, combining self-administration, judgmental, and snowball sampling techniques. A total of 404 responses were collected using structured questionnaires distributed via email. Based on Cochrane's formula, the sample size was determined with a 95% confidence level and a 5% margin of error. This ensured sufficient representation from each sector for reliable inferential statistics and minimized the risk of Type II errors.

In this study, data collection was conducted through an electronic and social media-based survey using Google Forms. The survey targeted staff from six key sectors in Nepal, gathering responses from 404 participants. Standardized questionnaires, crafted in English, were shared via online contacts. The collected data were automatically recorded in an Excel sheet and later analyzed using IBM SPSS version 25. The questionnaire was organized into

two sections: Section A collected demographic data, while Section B focused on five thematic components of organizational performance. Each section utilized a five-point Likert scale for respondents to rate their answers.

Table 1

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.960
Bartlett's Test of Sphericity	Approx. Chi-Square
	10660.03
	df
	703
	Sig.
	0.000

Figure 1

Measurement Model of Embedded Innovation and Technology in HR and its Effect on Organizational Performance

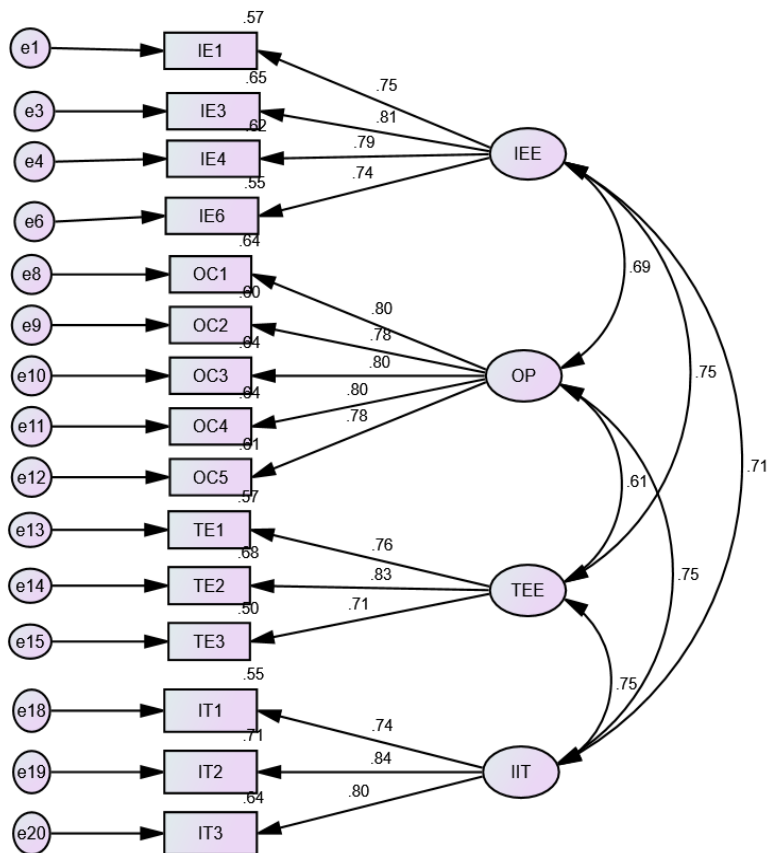


Table 2*Fit Indices of the Measurement Model*

Measure	Estimate	Threshold	Interpretation
CMIN	389.648	--	--
DF	164	--	--
CMIN/DF	2.376	Between 1 and 3	Excellent
CFI	0.953	>0.95	Excellent
SRMR	0.040	<0.08	Excellent
RMSEA	0.058	<0.06	Excellent

Table 3*Validity and Reliability Test*

Constructs	CR	AVE	MSV	MaxR(H)	IEE	TEE	OP	IIT
IEE	0.809	0.586	0.561	0.818	0.765			
TEE	0.855	0.596	0.557	0.857	0.746	0.772		
OP	0.894	0.627	0.564	0.894	0.612	0.690	0.792	
IIT	0.838	0.633	0.564	0.845	0.749	0.707	0.751	0.795

Note: IEE = Innovation, TEE= Technology, IIT = Innovation and Technology, OP = Organizational Performance

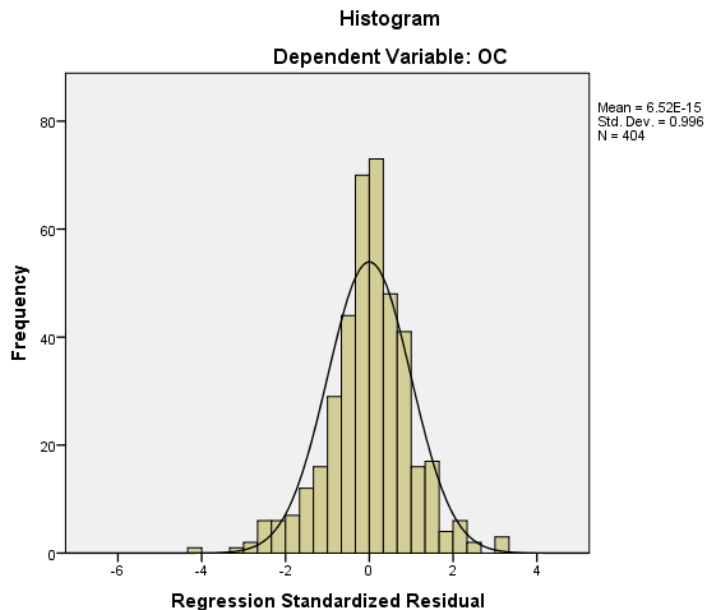
Figure 2*Figure of Data Normality*

Table 4*Test for Data Normality*

	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
IE	3.8252	.84388	-.725	.121	.081	.242
TE	3.9208	.77445	-.836	.121	.779	.242
IT	3.9158	.93374	-.813	.121	.229	.242
OP	4.1079	.81356	-1.096	.121	.996	.242

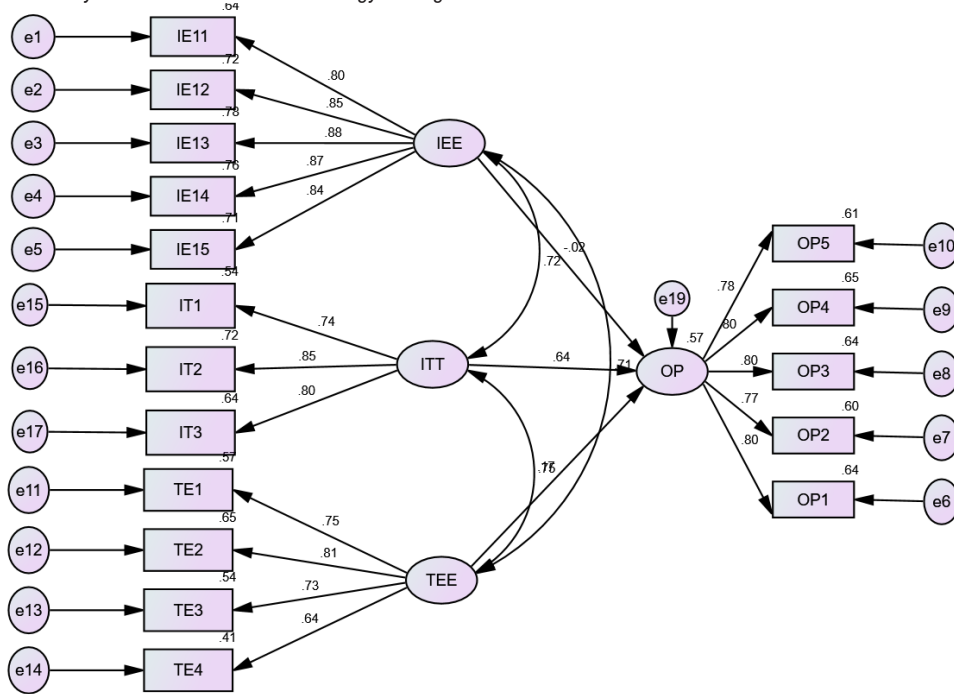
IV. Results and Discussion

Table 5*Correlation Analysis*

	IE	TE	IT	OP
IE	1	.214**	.312**	.253**
TE		1	.191**	.036**
IT			1	.174**
OP				1

** Correlation is significant at the 0.01 level (2-tailed)

The correlation analysis shows positive relationships between Innovation Embedded (IE), Technology Embedded (TE), Innovation and Technology Embedded HR Practices (IT), and Organizational Performance (OP). IE correlates with TE ($r = 0.214$), IT ($r = 0.312$), and OP ($r = 0.253$), while IT correlates with OP ($r = 0.174$), emphasizing their interconnected influence on performance.

Figure 3*Path Analysis of Innovation and Technology on Organizational Performance*

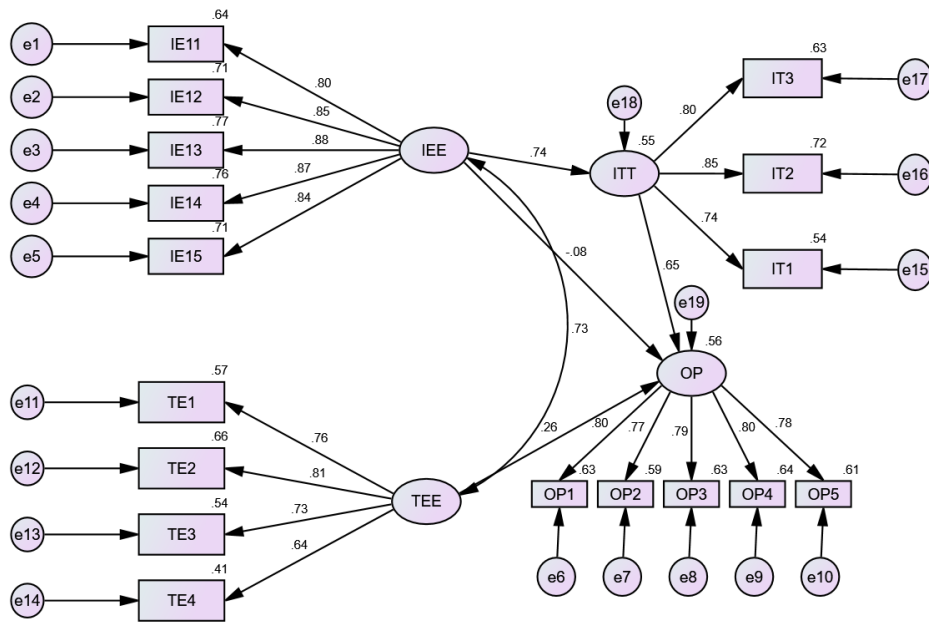
Note. IEE = Innovation Embedded, TEE = Technology Embedded, IIT = Innovation and Technology, OP = Organizational Performance

Table 6*Path Analysis*

	Path	Estimate	S.E.	C.R.	P
OP	<--- IEE	0.342	0.077	4.295	0.000
OP	<--- TEE	0.256	0.079	3.241	0.000
OP	<--- IIT	0.552	0.083	6.416	0.000

Note. IEE = Innovation Embedded, TEE = Technology Embedded, IIT = Innovation and Technology, OP = Organizational Performance

Figure 3 and Table 6 highlight the significant influence of embedded innovation and technology on organizational performance. The study shows that embedded innovation (IEE → OP, $\beta = 0.342$, $P < 0.01$) and technology (TEE → OP, $\beta = 0.256$, $P < 0.01$) significantly improve performance. Combined innovation and technology (IIT → OP, $\beta = 0.552$, $P < 0.01$) have the most substantial impact. The model fit well with various indices, reinforcing the findings' reliability. These insights underscore the importance of innovation and technology in driving organizational effectiveness and provide practical implications for leaders to enhance performance and maintain competitiveness in a dynamic business environment.

Figure 4*Mediation Analysis***Table 7***Results of Mediation Analysis*

Path	Estimate(β)	LL	UL
IE \rightarrow IT \rightarrow OP	0.247	0.156	0.357
TE \rightarrow IT \rightarrow OP	0.304	0.180	0.486
IT \rightarrow OP	0.639	0.469	0.845

Table 7 provides an analysis of the indirect effect of embedded innovation and technology on organizational performance, particularly within Human Resources (HR). The findings highlight that innovation significantly impacts performance, with a β coefficient of 0.247 (LL = 0.156, UL = 0.357), indicating its positive influence when integrated into organizational practices. Similarly, embedded technology exhibits a notable indirect effect on performance, with a β coefficient of 0.304 (LL = 0.180, UL = 0.845), emphasizing the role of technological integration in enhancing organizational outcomes. Additionally, the direct effect of embedded innovation and technology is substantial, with a β coefficient of 0.639 ($t = 6.78$, $p = 0.000$), underscoring their critical role in driving performance.

These results suggest that innovation and technology contribute significantly to organizational success when embedded within HR strategies. The study offers valuable insights into how organizations can leverage these factors to improve performance and effectiveness. For practitioners and leaders, the integration of innovation and technology into HR practices is key to fostering a culture of continuous improvement and sustaining competitive advantage.

The analysis deepens our understanding of the intricate relationships between innovation, technology, and organizational performance.

Table 8

Results of the Structural Path Model

Path	Estimate	P-value	Hypothesis	Remarks
IE → OP	0.342	0.000	H1	Accepted
TE → OP	0.156	0.000	H2	Accepted
IT → OP	0.639	0.000	H3	Accepted
IE → IT	0.388	0.000	H4	Accepted
TE → IT	0.476	0.000	H4	Accepted
IE → IT → OP	0.247	0.000	H6	Accepted
TE → IT → OP	0.304	0.000	H7	Accepted

The study reveals significant positive relationships between innovation embeddedness, technology embeddedness, IT integration, and organizational performance, with IT acting as a key mediator. Pathways like IE → IT → OP and TE → IT → OP show how innovation and technology indirectly boost organizational commitment. All relationships were statistically significant, emphasizing the role of IT in promoting innovation and strategic growth. Leaders and HR professionals are advised to prioritize innovation and technology investments, using IT as a strategic tool to enhance performance, employee commitment, and competitiveness. These insights offer guidance for managing and improving performance in today's dynamic business environment.

Empowering leadership significantly enhances team creativity and innovation by promoting autonomy, support, and psychological empowerment, as shown by Adeel et al. (2018). Rožman et al. (2023) emphasize the transformative role of AI in talent management, improving efficiency and skill development through AI-driven tools. Al-Alawi et al. (2023) highlight the importance of digital skills, IT infrastructure, and leadership support for successful HR digital transformation, especially during crises like COVID-19. Chatterjee et al. (2021) stress cultivating a data-driven culture to enhance decision-making and innovation. These factors enable organizations to adapt, grow, and remain competitive.

V. Conclusion and Implication

Organizations must integrate innovation, technology, and strong HR practices to remain competitive in today's fast-moving business environment. Innovation drives new ideas and solutions, enabling companies to develop products and processes that meet market needs. However, technology is vital to amplifying this impact. Advanced tools like AI and data analytics help streamline operations, automate tasks, and improve decision-making, boosting efficiency. Equally important are HR strategies focused on talent management, continuous learning, and creating a positive, collaborative workplace. By aligning innovation, technology, and HR practices, organizations enhance efficiency, adapt to market changes, reduce costs, and achieve sustainable success.

To improve employee well-being and boost organizational success, governments should promote innovation by implementing supportive policies, such as innovation incentive programs, technology adoption funds, and training in emerging technologies. These initiatives foster a culture of continuous improvement, collaboration, and adaptability. Additionally, investing in education to enhance workforce skills in areas like digital literacy and project management ensures that employees are well-prepared for technological advancements, driving organizational growth. Organizations should cultivate a lifelong learning mindset,

encouraging employees to develop their skills continuously. Strategic integration of innovation and technology through cross-functional collaboration and comprehensive training is crucial for aligning business goals with technological progress. Future research should explore the impact of advanced technologies like virtual reality in HR practices across different industries, with longitudinal studies tracking the long-term effects of technology adoption. Moreover, understanding employee perceptions and global trends in technology use can offer valuable insights for enhancing organizational effectiveness.

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