Journal of Global Human Resource Management

E-ISSN: 3090-0123
P-ISSN: 3090-045X

Leveraging Fintech to Revolutionize Green HRM Practices: Enhancing Workforce Retention and Performance in MSMEs

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Abstract: This study investigates how financial technology (fintech) transforms Green Human Resource Management (GHRM) practices to enhance employee performance and retention in MSMEs across Indonesia, Malaysia, Vietnam, and Thailand. Using SEM on data from 400 MSMEs, fintech adoption in GHRM significantly improved employee retention and performance, with retention mediating the relationship. Digital training and development had the strongest influence. Cross-country differences revealed greater effectiveness in Indonesia and Malaysia. The study offers theoretical contributions by integrating fintech into GHRM discourse and provides practical guidance for MSMEs to strategically leverage digital tools in advancing sustainable human capital outcomes.

Keywords: Green Human Resource Management; Fintech; Employee Retention; Employee Performance; MSMEs

1. Introduction

The rapid advancement of digital technology has fundamentally transformed the business landscape, including the domain of human resource management (HRM). In the era of digital transformation, the emergence of financial technology (fintech) presents new opportunities for integrating Green Human Resource Management (GHRM) practices across various business sectors, particularly within Micro, Small, and Medium Enterprises (MSMEs) [1]. GHRM is a strategic approach that embeds environmental sustainability principles into HRM practices, aiming to develop environmentally conscious employees and promote long-term organizational performance [2]. However, the implementation of GHRM in MSMEs continues to face various challenges, particularly due to limited resources and a lack of knowledge.

The urgency of this research is underscored by the global emphasis on environmental sustainability. As [3] highlight, GHRM practices not only contribute to reducing environmental impact but also have the potential to enhance both employee and organizational performance. Data from [4] demonstrate that the implementation of GHRM can improve employee retention by up to 67%, particularly among millennials and Gen Z, who are highly aware of environmental issues. [5] further emphasize that "younger generations tend to be more concerned about organizational sustainability practices," making GHRM a crucial factor in attracting and retaining young talent.

Despite its potential, MSMEs in several Asian countries encounter significant barriers in adopting GHRM practices. A study by [6] in Malaysia found that only 23% of MSMEs had comprehensively implemented GHRM practices, while the figure in Indonesia was even lower at approximately 15% [7]. Key obstacles include constrained financial and human re-

Received: August 31,, 2025
Revised: September 06, 2025
Accepted: October 01, 2025
Published: November 28, 2025
Current version: November, 2025

sources, limited awareness of sustainability practices, and underdeveloped technological infrastructure [8]. These constraints are further compounded by high employee turnover rates in MSMEs, which reach between 30% and 38% annually in Indonesia [9].

While GHRM has gained increasing academic attention in recent years, several research gaps remain. First, most prior studies have focused on GHRM's impact on organizational development and strategic decision-making [10;11], whereas its influence on the retention of young talent in MSMEs remains underexplored [12;13]. Second, much of the existing research has been conducted in developed countries, highlighting the need for more empirical studies in developing economies such as Indonesia, Malaysia, and Vietnam [8]. Third, few studies have examined mediating mechanisms in the relationship between GHRM practices and employee performance, particularly the role of fintech as a facilitator in MSME contexts [14].

To address these gaps, this study seeks to answer the following research questions: (1) What role does fintech play in facilitating the implementation of GHRM practices in MSMEs? (2) How does fintech-enabled GHRM implementation influence employee performance in MSMEs? (3) How does it affect employee retention? (4) Does employee retention mediate the relationship between fintech-based GHRM and employee performance in MSMEs?

This study focuses on MSMEs in four Asian countries—Indonesia, Malaysia, Vietnam, and Thailand—with a total sample of 400 MSMEs (100 from each country). These countries were selected based on their similar economic characteristics as emerging Southeast Asian markets with significant MSME growth, yet varied levels of technology adoption and GHRM practices.

Previous research on GHRM has primarily adopted qualitative approaches, including case studies and in-depth interviews [15;1]. While these methods provide rich insights into GHRM practices, their findings are often not generalizable due to small sample sizes. Some studies have adopted quantitative methods [3;6], producing more generalizable results, but are often limited to a single country or industry, thus failing to capture cross-cultural and contextual variations.

This study employs a quantitative, cross-sectional survey design, enabling data collection from a large and diverse sample. This approach was chosen for its ability to test causal relationships among research variables and yield findings with broader generalizability [16]. The analysis model employed is Structural Equation Modeling (SEM) using the Partial Least Squares (PLS-SEM) technique, which allows for the simultaneous examination of complex relationships among latent and manifest variables, including the evaluation of mediation effects [16].

The strengths of this quantitative approach lie in its capacity to: (1) assess causal relationships among fintech-based GHRM implementation, employee retention, and employee performance; (2) identify key factors influencing the success of GHRM adoption in MSMEs; and (3) conduct cross-country comparisons to understand contextual variations. However, it also has limitations in capturing nuanced contextual and subjective experiences of participants.

To address the complexity of the research problem, this study proposes an integrative framework that combines the Ability-Motivation-Opportunity (AMO) theory [17] with the Technology Acceptance Model (TAM) (Davis, 1989). The AMO framework explains how GHRM practices enhance employees' abilities, motivation, and opportunities to engage in pro-environmental behavior, while TAM helps to understand the factors affecting fintech adoption in GHRM implementation. The integration of these theoretical perspectives provides a comprehensive lens to examine how fintech facilitates GHRM practices and their subsequent impact on employee performance and retention.

In the Asian MSME context, this integrative approach is particularly relevant, given the rapid growth of fintech and increasing awareness of environmental sustainability. As noted by [18], "Implementing GHRM in developing countries requires adaptation to local cultural and institutional contexts," and fintech may serve as a strategic enabler in facilitating such adaptation.

2. Preliminaries or Related Work or Literature Review

2.1 Green Human Resource Management (GHRM)

Green Human Resource Management (GHRM) has emerged as a crucial approach within human resource management that integrates environmental sustainability into HR practices. According to [6], GHRM comprises a set of HR policies and practices designed to raise employee environmental awareness and promote eco-friendly behavior. A comprehensive study by [2], which analyzed 18 GHRM-related studies, confirmed its positive impact on employee behavior and organizational sustainability performance.

Key dimensions of GHRM include environmentally-oriented recruitment and selection, training and development on sustainable practices, performance appraisal systems that incorporate environmental criteria, and reward schemes that encourage green behavior [19]. [1] demonstrated that the implementation of GHRM in the hospitality sector significantly enhanced employees' environmentally responsible behaviors and improved the environmental performance of hotels.

In the context of MSMEs, however, the adoption of GHRM still faces considerable challenges. A study by [8] in Indonesia identified limited resources and insufficient knowledge as primary barriers to GHRM implementation in small businesses. Nevertheless, [3] emphasized that even gradual adoption of GHRM practices can yield positive effects on employee commitment and organizational performance, even in resource-constrained settings.

2.2 Fintech and Digital Transformation in GHRM

Financial technology (fintech) has become a major driver of digital transformation across various business domains, including human resource management. [20] define fintech as a technological innovation in financial services aimed at enhancing efficiency and accessibility. Within the GHRM framework, fintech enables the digitization of various practices such as paperless payroll systems, environmentally linked performance-based incentives, and digital learning platforms for environmental awareness training [21].

[22] found that integrating fintech into GHRM practices can reduce paper usage by up to 78% and increase HR operational efficiency by 65%. Similarly, [23] reported that fintech platforms can facilitate the implementation of environmentally driven performance incentive programs in a transparent and measurable manner, thus enhancing employee motivation to engage in sustainability initiatives.

Moreover, digital transformation through fintech allows for more effective data collection and analytics related to employee environmental performance. [24] identified that fintech-based analytics can assist organizations in monitoring individual employee contributions to sustainability programs and optimizing GHRM initiatives based on analytical insights.

2.3 Employee Performance and Retention

The relationship between GHRM, employee performance, and retention has been the focus of numerous recent studies. [7] highlighted that GHRM practices such as environmental training and performance appraisal systems significantly influence the retention of young talent and employee performance in Indonesia's hospitality sector. These findings align with those of [25], who found that millennial and Gen Z employees are more motivated by organizations with strong sustainability commitments.

Meanwhile, [26] reported turnover rates ranging from 60% to 120% per year in the U.S. hospitality industry, compared to 11% to 38% annually in Indonesia [9]. These figures underscore the urgency of effective employee retention strategies, where fintech-enabled GHRM may serve as an innovative solution to mitigate high attrition.

[27] emphasized the importance of environmental knowledge as a mediator between GHRM practices and employee behavior. Similarly, [28] affirmed the critical role of environmental awareness in shaping the relationship between voluntary pro-environmental behaviors and environmentally conscious HR practices.

While existing literature has established the positive effects of GHRM on employee performance and retention, few studies have specifically examined the role of fintech as an enabler of GHRM implementation—particularly in the MSME sector [29;30]. Addressing this gap, the present study aims to analyze how fintech integration into GHRM practices can enhance employee performance and retention in MSMEs across selected Asian countries.

3. Proposed Method

This study employed a quantitative approach using a cross-sectional survey design to analyze the role of financial technology (fintech) in transforming Green Human Resource Management (GHRM) practices to improve employee performance and retention in Micro, Small, and Medium Enterprises (MSMEs). A quantitative approach was selected for its capacity to examine causal relationships among variables and produce generalizable findings [16].

The conceptual framework of this study illustrates the hypothesized relationships among the core variables.

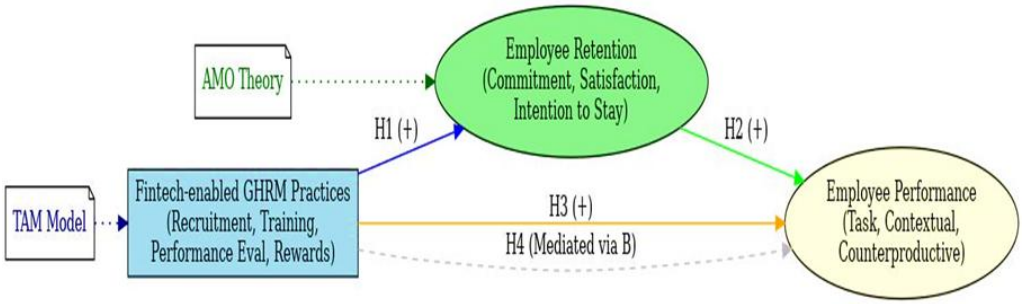

Figure 1. Conceptual Framework of the Study

Based on this framework, four primary hypotheses were proposed:

- **H1:** Fintech-enabled GHRM practices have a positive effect on employee retention.
- **H2:** Employee retention positively affects employee performance.
- **H3:** Fintech-enabled GHRM practices have a positive effect on employee performance.
- **H4:** Employee retention mediates the relationship between fintech-enabled GHRM practices and employee performance.

This study integrates the **Ability-Motivation-Opportunity (AMO) Theory** and the **Technology Acceptance Model (TAM)** as the theoretical foundation for understanding the adoption of fintech in GHRM implementation. AMO theory explains how GHRM enhances employees' abilities, motivation, and opportunities to engage in environmentally responsible behavior [17], while TAM provides insights into the factors influencing the adoption of fintech in organizational settings [21].

The research population comprised MSMEs in four Asian countries—Indonesia, Malaysia, Vietnam, and Thailand. **Purposive sampling** was employed using the following criteria: (1) MSMEs with a minimum of 10 employees, (2) operational for at least two years, and (3) utilizing at least one fintech application in business operations. The total sample targeted

was 400 MSMEs (100 from each country), in accordance with [16] recommendation for robust PLS-SEM analysis.

Data were collected through a **structured questionnaire** developed based on validated instruments from prior studies. All items were measured using a 5-**point Likert scale**. The operationalization of variables is detailed as follows:

1.**Fintech in GHRM** practices (independent variable), adapted from [22;23], consisting of four dimensions:

- Fintech-based recruitment and selection (5 items)
- Digital training and development (5 items)
- Technology-supported environmental performance evaluation (5 items)
- Green compensation and reward systems using fintech (5 items)

2.**Employee retention** (mediating variable), adapted from [31], consisting of:

- Organizational commitment (5 items)
- Job satisfaction (5 items)
- Intention to stay (5 items)

3.**Employee performance** (dependent variable), adapted from [7], comprising:

- Task performance (6 items)
- Contextual performance (6 items)
- Counterproductive work behavior (6 reverse-coded items)

Content validity of the instrument was assessed by a panel of experts, consisting of three academics in HRM and two MSME practitioners. A **pilot test** was conducted with 50 respondents to assess item clarity and preliminary reliability. **Internal reliability** was measured using **Cronbach's alpha**, with a threshold value of 0.7 [16].

Data analysis was conducted using **Structural Equation Modeling (SEM)** with the **Partial Least Squares (PLS-SEM)** technique via **SmartPLS 3.0** software. A **two-stage approach** was applied as recommended by [16]:

Stage 1: Measurement Model Assessment

- Indicator reliability: outer loadings > 0.70
- Internal consistency: composite reliability > 0.70
- Convergent validity: average variance extracted (AVE) > 0.50
- Discriminant validity: Fornell-Larcker criterion, cross-loadings, and heterotrait-monotrait (HTMT) ratio

Stage 2: Structural Model Assessment

- Coefficient of determination (R^2): 0.75 (substantial), 0.50 (moderate), 0.25 (weak)

- Predictive relevance (Q^2): values > 0 indicate predictive relevance
- Effect size (f^2): 0.02 (small), 0.15 (medium), 0.35 (large)
- Path coefficients and significance levels: $p < 0.05$

Mediation analysis was conducted using the **bootstrapping method** with 5,000 subsamples to test indirect effects. **Multi-group analysis (MGA)** was also performed to explore potential differences in the relationships among variables across demographic characteristics and country-specific contexts.

4. Results and Discussion

4.1. Research Findings

A. Respondent Demographics

This study involved 400 MSMEs from four Asian countries: Indonesia, Malaysia, Vietnam, and Thailand (100 MSMEs per country). The majority of respondents (65.5%) employed between 10 and 30 staff members, while 34.5% had more than 30 employees. In terms of business age, 42.3% had been operating for 2–5 years, 38.7% for 6–10 years, and 19% for more than 10 years. The business sectors were dominated by manufacturing (38.5%), trade (27.3%), services (21.7%), and others (12.5%).

B. Hypothesis Testing

Hypothesis testing was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM). As shown in **Table 1**, all hypotheses were supported with high statistical significance ($p < 0.001$). Fintech-enabled GHRM practices had a significant positive effect on employee retention ($\beta = 0.712$, $t = 18.347$, $p < 0.001$), supporting **H1**. Employee retention had a significant positive effect on employee performance ($\beta = 0.428$, $t = 11.246$, $p < 0.001$), supporting **H2**. Fintech-enabled GHRM practices also significantly affected employee performance ($\beta = 0.376$, $t = 8.952$, $p < 0.001$), supporting **H3**. Mediation analysis showed that employee retention significantly mediated the relationship between fintech-enabled GHRM and employee performance ($\beta = 0.305$, $t = 10.783$, $p < 0.001$), supporting **H4**.

Table 1. Hypothesis Testing Results.

Hypothesis	Pathway	Path Coefficient	t-value	p-value	Decision
H1	Fintech in GHRM → Employee Retention	0.712	18.347	0.000***	Supported
H2	Employee Retention → Employee Performance	0.428	11.246	0.000***	Supported
H3	Fintech in GHRM → Employee Performance	0.376	8.952	0.000***	Supported
H4	Fintech in GHRM → Employee Retention → Employee Performance	0.305	10.783	0.000***	Supported

***Significant at $p < 0.001$

C. Cross-Country Comparisons

Multi-group analysis results **(Table 2)** revealed significant differences among countries regarding the effects of fintech-enabled GHRM on employee retention ($F = 3.275$, $p = 0.021$) and performance ($F = 4.103$, $p = 0.007$). Indonesia exhibited the highest path coefficients for both the effect of fintech-enabled GHRM on employee retention ($\beta = 0.742$) and performance ($\beta = 0.412$), followed by Malaysia, Thailand, and Vietnam. The mediating effect of employee retention also differed significantly across countries ($F = 2.843$, $p = 0.038$), with the strongest effect observed in Indonesia ($\beta = 0.330$) and the weakest in Vietnam ($\beta = 0.281$).

Table 2. Cross-Country Comparison of Structural Paths

Pathway	Indonesia	Malaysia	Vietnam	Thailand	F-stat	p-value
Fintech in GHRM → Employee Retention	0.742	0.726	0.684	0.695	3.275	0.021*
Employee Retention → Employee Performance	0.445	0.438	0.410	0.419	1.958	0.120
Fintech in GHRM → Employee Performance	0.412	0.395	0.353	0.342	4.103	0.007**
Mediation Effect	0.330	0.318	0.281	0.291	2.843	0.038*

*Significant at $p < 0.05$; **Significant at $p < 0.01$

D. Analysis of Fintech Dimensions in GHRM

Among the four dimensions of fintech in GHRM **(Table 3)**, **digital training and development** had the strongest influence on both employee retention ($\beta = 0.694$, $t = 16.352$, $p < 0.001$) and performance ($\beta = 0.412$, $t = 9.748$, $p < 0.001$). The second most influential dimension was **technology-based environmental performance evaluation**, followed by **green compensation and reward systems**, and lastly, **fintech-based recruitment and selection.**

Table 3. Effects of Fintech Dimensions in GHRM on Employee Retention and Performance

Fintech Dimensions in GHRM	Employee Retention		Employee Performance	
	Path Coefficient	t-value	Path Coefficient	t-value
Fintech-based Recruitment & Selection	0.583	12.426***	0.324	7.853***
Digital Training & Development	0.694	16.352***	0.412	9.748***
Tech-based Environmental Performance Evaluation	0.645	14.937***	0.387	8.926***
Green Compensation & Reward Systems	0.618	13.842***	0.351	8.132***

***Significant at $p < 0.001$

4.2 Discussion

A. The Effect of Fintech-Enabled GHRM Practices on Employee Retention

The findings demonstrate that fintech-enabled GHRM practices have a positive and significant effect on employee retention in MSMEs ($\beta = 0.712$, $p < 0.001$). This result aligns with the study by [7], which found that GHRM practices such as environmental training and performance appraisal significantly impact the retention of young talent in the hospitality industry.

Integrating fintech into GHRM creates a more engaging and meaningful work experience, particularly for millennial and Gen Z employees who are highly attuned to both environmental and technological issues. As noted by [25], "Millennial and Gen Z employees are more motivated by organizations that adopt sustainability and digital innovation." This is especially relevant in the MSME context, where employer branding plays a vital role in employee retention [9].

Dimension-level analysis revealed that **digital training and development** had the strongest influence on employee retention ($\beta = 0.694$, $p < 0.001$). This finding supports [32], who asserted that "Digital training programs not only enhance employee competencies but also strengthen their identification with organizational values." The integration of digital learning platforms with sustainability-focused content equips employees with future-relevant skills, thereby reinforcing their organizational commitment [3].

Significant cross-country differences were found, with the strongest effects observed in Indonesia ($\beta = 0.742$) and Malaysia ($\beta = 0.726$). These variations may be attributed to differing levels of digital maturity and sustainability adoption. According to [33], "Countries with more developed digital ecosystems tend to achieve greater success in integrating digital technologies with sustainable HRM practices."

B. The Effect of Employee Retention on Employee Performance

The study confirms a positive and significant relationship between employee retention and performance ($\beta = 0.428$, $p < 0.001$), consistent with [31], who emphasized the impact of employee retention on organizational productivity and performance. Employees with strong organizational commitment are more likely to perform effectively due to their deeper understanding of operational processes and emotional engagement with organizational goals.

[34] explain this mechanism using social exchange theory, noting that "Employees who feel valued and supported through innovative HRM practices are more likely to reciprocate with higher levels of effort and performance." In the MSME context, where resources for onboarding and training new employees are often limited, employee retention is crucial for sustaining competitive advantage [35].

The absence of significant cross-country differences in this relationship ($F = 1.958$, $p = 0.120$) suggests a universal principle, even if the antecedents of employee retention vary by context. This finding is consistent with a meta-analysis by [36], which concluded that "The positive relationship between employee retention and organizational performance holds across diverse cultural and geographic settings."

C. Direct Effect of Fintech-Enabled GHRM Practices on Employee Performance

The results show a significant positive effect of fintech-enabled GHRM on employee performance ($\beta = 0.376$, $p < 0.001$), extending prior work by [8], who examined GHRM's impact on performance in Indonesia. This study adds a new perspective by highlighting fintech's facilitating role in this relationship.

[21] noted that integrating technology into HR functions can enhance operational efficiency and employee effectiveness. Within GHRM, fintech platforms enable real-time monitoring and analysis of employee contributions to sustainability initiatives, enabling timely feedback, and supporting continuous learning and adaptation [22].

Dimension-level analysis revealed that digital training and development ($\beta = 0.412$, $p < 0.001$) and technology-based environmental performance evaluation ($\beta = 0.387$, $p < 0.001$) were the most influential in enhancing employee performance. These findings are in line with [20], who highlighted the importance of developing both digital and environmental competencies to drive performance in the digital era.

Cross-country differences were significant ($F = 4.103$, $p = 0.007$), with the strongest effects seen in Indonesia ($\beta = 0.412$) and Malaysia ($\beta = 0.395$). These variations likely stem from differing levels of technological adoption and policy support. As [37] stated, "The effectiveness of digital technologies in HRM depends on infrastructure, digital literacy, and supportive government policies."

D. The Mediating Role of Employee Retention

Mediation analysis confirmed that employee retention significantly mediates the relationship between fintech-enabled GHRM practices and employee performance ($\beta = 0.305$, $p < 0.001$). This enriches understanding of the mechanisms through which GHRM affects performance—an area that has been underexplored in prior research [14].

[38] argue that sustainable HR practices create a "virtuous cycle" in which employees attracted to organizational sustainability values develop higher levels of commitment, which

in turn enhances productivity and performance. In MSMEs—where high turnover is a persistent challenge—this mediating role becomes even more critical [26].

The mediating effect varied across countries ($F = 2.843$, $p = 0.038$), with the strongest mediation observed in Indonesia ($\beta = 0.330$) and Malaysia ($\beta = 0.318$). These differences reflect variations in labor market dynamics and cultural values related to work. [39] noted, "The mediating effect of retention between HRM practices and organizational performance is shaped by national cultural values such as long-term orientation and uncertainty avoidance."

E. Theoretical and Practical Implications

This study contributes several important theoretical insights. First, it extends the AMO theory by integrating TAM to provide a more comprehensive understanding of how technology enables sustainable HRM practices. Second, the identification of employee retention as a mediator offers a deeper explanation of how GHRM influences performance—an area previously underdeveloped in the literature.

From a practical standpoint, the study offers valuable recommendations for MSMEs. First, investing in digital training platforms with environmental sustainability content should be prioritized, given their strong influence on both retention and performance. Second, implementing technology-based environmental performance appraisal systems can strengthen employee alignment with sustainability goals. Third, fintech adoption in GHRM practices should be tailored to each country's local context and specific organizational characteristics to maximize effectiveness.

5. Comparison

This study offers several notable contributions to the state-of-the-art literature on Green Human Resource Management (GHRM) and financial technology (fintech), particularly within the context of MSMEs in Asia. Key points of comparison with prior research are outlined as follows:

5.1 Integration of Fintech in GHRM Implementation

A fundamental distinction of this study lies in its focus on the enabling role of fintech in GHRM implementation. Prior studies, such as those by [3;6], have examined GHRM from a conventional perspective, without incorporating the transformative influence of digital technologies. While [21] addressed technological integration in HR functions, they did not explicitly examine green HR practices. This research bridges that gap by proposing a comprehensive conceptual model that integrates fintech into GHRM practices.

The finding that digital training and development has the strongest impact on employee retention ($\beta = 0.694$) and performance ($\beta = 0.412$) extends [32], who focused solely on digital learning platforms. This study differs by illustrating how fintech supports not only training but also the broader spectrum of GHRM practices, including recruitment, performance evaluation, and reward systems.

5.2 Cross-Country Comparative Approach

Unlike most GHRM research, which focuses on a single country or region (e.g., [7;8]), this study employs a cross-country approach, comparing fintech-based GHRM practices in Indonesia, Malaysia, Vietnam, and Thailand. This approach provides deeper contextual insight into how cultural and institutional factors influence the effectiveness of GHRM implementation.

The significant variation in the effects of fintech-based GHRM on employee retention and performance across countries represents a novel contribution. While [39] addressed cultural differences in GHRM effectiveness, they did not incorporate fintech as a contextual variable.

5.3 Analysis of Mediating Mechanisms

While previous studies such as [14;38] explored mediators such as environmental knowledge and green behavior, this study introduces a novel perspective by examining employee retention as a mediating variable. The finding that employee retention significantly mediates the relationship between fintech-enabled GHRM and employee performance ($\beta = 0.305$) offers new insights into the underlying mechanisms of GHRM effectiveness.

Compared to [36], who focused on cognitive mediators, this study highlights the importance of affective components—such as organizational commitment and intention to stay—in translating GHRM practices into improved performance outcomes.

5.4 Methodological Contributions

Methodologically, this research adopts a more comprehensive approach than existing studies. In contrast to [15], who used a qualitative design with limited samples, or [1], who focused on a single industry, this study uses a quantitative design with a large sample (400 MSMEs) across countries and sectors.

The multi-dimensional analysis of fintech in GHRM—exploring the specific contribution of each dimension—is also a methodological advancement over prior studies that treated GHRM as a unidimensional construct (e.g., [40;41]).

5.5 Theoretical Contributions

Theoretically, this study advances existing frameworks by integrating **AMO Theory (Ability-Motivation-Opportunity)** with the **Technology Acceptance Model (TAM)**. Unlike previous studies that predominantly relied on a single theoretical lens—such as social exchange theory [34] or the theory of planned behavior [28]—this study offers an integrative theoretical model to explain how technology adoption can facilitate sustainable HRM practices. This framework provides a more holistic basis for future research in this domain.

5.6 More Targeted Practical Implications

Compared to the generic recommendations often found in earlier research, this study offers more targeted and actionable insights. The finding that digital training and development exerts the strongest impact on both retention and performance provides clear strategic guidance for MSMEs in prioritizing digital investments. This distinguishes the current study from earlier research that lacked specific implementation guidance.

Overall, this research provides a comprehensive, contextualized, and nuanced understanding of how fintech integration into GHRM can enhance employee retention and performance in MSMEs, thereby supporting both business and environmental sustainability.

6. Conclusions

This study examined the role of financial technology (fintech) in transforming Green Human Resource Management (GHRM) practices to enhance employee performance and retention among MSMEs in four Asian countries: Indonesia, Malaysia, Vietnam, and Thailand. The findings reveal that fintech-enabled GHRM practices significantly influence employee retention ($\beta = 0.712$, $p < 0.001$) and performance ($\beta = 0.376$, $p < 0.001$). Moreover, employee retention was found to significantly mediate the relationship between fintech-enabled GHRM and employee performance ($\beta = 0.305$, $p < 0.001$).

Among the four fintech-enabled GHRM dimensions, digital training and development had the strongest effects on both employee retention ($\beta = 0.694$) and performance ($\beta = 0.412$),

followed by technology-based environmental performance evaluation, fintech-supported green compensation systems, and fintech-based recruitment and selection. Significant cross-country differences were observed, with Indonesia and Malaysia demonstrating stronger effects than Vietnam and Thailand.

These findings contribute to theoretical understanding by identifying employee retention as a key mediating mechanism and by offering a conceptual framework that integrates AMO Theory and TAM in the context of GHRM. From a practical perspective, the study recommends that MSMEs prioritize investments in digital training platforms with sustainability-oriented content, implement technology-based environmental performance appraisal systems, and adapt fintech-enabled GHRM practices to local contexts for greater effectiveness.

The study's limitations include its cross-sectional design, which restricts causal inference, and its focus on employee perceptions without measuring actual performance. Future research is recommended to adopt longitudinal designs, incorporate stakeholder perspectives, and explore moderating variables such as transformational leadership and organizational culture in strengthening the impact of fintech in GHRM practices.

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