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Green human resource management and eco-innovation: Interplay of green shared vision and digital readiness

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ABSTRACT

Manufacturing companies need to develop eco-innovations that can address two challenges at once: reducing emissions or environmental waste and maintaining operational efficiency. This study examines the effect of green human resource management on green eco-innovation, with green shared vision as a mediator and digital readiness as a moderator. This study uses purposive sampling; data were collected from 300 supervisors and managers in manufacturing organizations in West Java, East Java, and Batam, Indonesia. The data were analyzed using SmartPLS 4.0, including testing the measurement model, structural model, and hypotheses. The results indicate that green human resources management positively affects green shared vision and eco-innovation. Green shared vision directly affects eco-innovation and mediates the relationship between the independent variables and eco-innovation. Digital readiness does not significantly moderate the direct relationship between green human resources management and eco-innovation; however, it positively moderates the relationship between green shared vision and eco-innovation. This study extends the natural resources-based view and the ability-motivation-opportunity framework to explain eco-innovation. These findings indicate that digital readiness can serve as a specific enabling condition along certain pathways, rather than a universal enhancer of green human resource management.

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1. Introduction

The manufacturing industry faces significant pressure to reduce the environmental impact of its production activities (Fang et al., 2022). Energy and process emissions remain critical issues in the industrial sector, while pressure from regulators, buyers, and the supply chain is increasingly driving companies to integrate environmental factors into their strategic

responses (Cai & Li, 2018; Vence & Pereira, 2018; Zhang & Ma, 2020; Liu & Rumánková, 2022; Farooq et al., 2024). At the same time, companies must control costs and maintain profits through efficient production processes (Jain et al., 2024). As a result, companies face the dual challenge of reducing environmental impact while maintaining production efficiency.

Eco-innovation refers to developing and implementing new processes, products, or practices that prevent environmental damage while improving energy efficiency (Albitar et al., 2023). Product redesign, recycling, energy efficiency, waste reduction, and cleaner production can reduce environmental impacts while protecting operational value (Liu et al., 2025). However, innovation success depends not only on technology but also on an organization's ability to guide employees to identify environmental issues, generate solutions, and implement them in work processes (Yang & Li, 2023). When environmental goals are not yet integrated into work practices and employee behavior, achieving eco-innovation optimally is difficult. Therefore, a systematic human resource management approach is needed that integrates environmental goals into work practices and employee engagement.

In response to these challenges, green human resources management has emerged as an approach that integrates environmental priorities into human resources management practices such as recruitment, training, performance evaluation, rewards, and employee engagement (Dumont et al., 2017; Sabokro et al., 2021). Through these practices, companies build employees' knowledge, skills, and behaviors that support environmental goals and encourage their involvement in generating eco-innovation (Singh et al., 2020; Fang et al., 2022; Aftab et al., 2023; Niazi et al., 2023). However, several studies indicate that this relationship does not always occur automatically, as the effectiveness of green human resources management depends on how organizational members understand and interpret these practices (Yang & Li, 2023; Mamun, 2026). A company's green human resources management efforts do not always guarantee that employees and organizational functions interpret environmental priorities in the same way. Without a shared understanding of environmental issues, even skilled employees may not be enough; companies must ensure these efforts align with shared understanding and common environmental goals to achieve consistent results.

A green shared vision helps align these environmental priorities. This vision refers to a collective understanding of an organization's environmental direction and priorities, reducing ambiguity, aligning cross-functional decisions, and establishing common criteria for product and process experimentation (Chen et al., 2015; Fang et al., 2021). When employees and organizational functions share a common understanding of environmental goals, green human resources management efforts can align on the same priorities, making it easier to translate them into eco-innovation. A shared green vision provides a theoretically relevant mediating mechanism for linking green human resources management to eco-innovation (Ma et al., 2023; Lu et al., 2024). However, researchers have studied this vision, as a collective socio-cognitive mechanism, less extensively than individual behavioral mechanisms. Furthermore, a shared vision alone is not necessarily sufficient to generate eco-innovation, as implementation still depends on organizational conditions that translate environmental priorities into action. Integrated data, digital infrastructure, analytics, integration, and employee digital literacy can help organizations monitor, coordinate, and set environmental priorities within the innovation process (Hanelt et al., 2021; Verhoef et al., 2021; Di Maria et al., 2022). In this context, digital readiness matters because it can help translate green human resources management and a shared green vision into eco-innovation.

Digital readiness reflects the extent to which an organization adopts, integrates, and utilizes digital technologies to support work processes (Machado & Oberg, 2021). A shared "green vision" may remain merely aspirational and fail to translate into eco-innovation if the company lacks integrated data, digitally skilled employees, managerial support, or interconnected operational systems. Digital readiness can also strengthen green human resources management contribution to eco-innovation by providing digital capabilities that

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help employees translate green behaviors into innovation (Wang & Zhong, 2024; Yang & Liu, 2024). Previous studies have often treated digital capabilities as a general prerequisite or universal enabler, leaving it unclear whether they strengthen the green human resources management system itself or specifically facilitate implementing a green shared vision. This study addresses this gap by comparing the broad green human resources management-digital readiness interaction with the more targeted green shared vision-digital readiness interaction.

This study uses the natural resources-based view (NRBV) as its primary framework, which posits that environment-oriented resources and capabilities can help achieve organizational goals (Hart, 1995). In this context, green human resources management, a green shared vision, and digital readiness are viewed as resources and capabilities that help companies implement and develop eco-innovation (Hart, 1995). This perspective is complemented by ability-motivation-opportunity (AMO) theory, used more narrowly as an interpretive lens for the functions represented by green human resources management practices (Obeidat et al., 2016). AMO explains how green human resources management practices shape employees' ability, motivation, and opportunities to contribute to eco-innovation. This study contributes by distinguishing the broad, direct complementarity between green human resources management and digital readiness from the more specific, vision-based complementarity in implementation.

Indonesia's manufacturing sector shows diverse technological capabilities, workforce readiness, supply chain integration, and access to digital infrastructure (Mursadi et al., 2024). This study examines West Java, East Java, and Batam because each has distinct manufacturing characteristics. West Java and East Java represent dense domestic manufacturing corridors. In contrast, Batam operates as a Free Trade Zone and Free Port with relatively strong exposure to cross-border investment, international logistics, and pressure for technology transfer (Nureen et al., 2023). This diversity matters because differences in digital readiness and operational environments can affect companies' ability to translate environmental orientation into eco-innovation. Thus, these three regions were selected not to represent the entire Indonesian manufacturing industry, but to provide diverse empirical contexts for testing the relationship between green human resources management and eco-innovation through the mediating mechanism of green shared vision and the moderating role of digital readiness.

2. Literature Review and Hypothesis Development

2.1. Literature Review

2.1.1. Grand Theory

The natural resources-based view (NRBV), developed by Hart (1995), serves as the study's primary theoretical foundation and explains how green human resources management, a green shared vision, and digital readiness can influence eco-innovation. The NRBV explains how organizational resources and capabilities directed toward pollution prevention, product responsibility, and sustainable development can contribute to environmental and organizational value (Hart, 1995; Almada et al., 2022). From the NRBV perspective, green human resources management builds and guides human resources to support environmental goals, creating conditions that enable contributions to eco-innovation (Alshehri et al., 2024). This perspective also explains that a shared green vision, as a socio-cognitive resource, can reduce ambiguity about environmental priorities and help companies integrate dispersed knowledge to support eco-innovation (Ngo, 2024; Liu et al., 2025). Meanwhile, digital readiness serves as an implementation capability that helps companies access information and coordinate processes to translate environmental resources into innovation (Cheng et al., 2024). However, the NRBV framework still explains this relationship at the

organizational level, whereas green human resources management also enables individual employee contributions.

To explore these mechanisms in greater depth, this study uses the ability-motivation-opportunity (AMO) framework developed by Appelbaum et al. (2000) as an interpretive lens for green human resources management practices. Appelbaum et al. (2000) explain that employee contributions are influenced by the abilities, motivation, and opportunities the organization provides. In green human resources management practices, environmentally friendly recruitment and training can build ability; performance evaluations and rewards can provide motivation; and organizational involvement and support may provide opportunities for employees to participate in environmental improvement (Obeidat et al., 2016). Thus, integrating NRBV and AMO provides a comprehensive, interpretive explanation of how green human resources management influences eco-innovation, mediated by a shared green vision and moderated by organizational-level digital readiness. The empirical model did not test AMO as a mechanism or construct, nor did it treat it as part of a multilevel emergence process.

2.1.2. Eco-Innovation

Eco-innovation refers to technical progress achieved through implementing new practices, products, or processes to prevent and reduce environmental damage (Albitar et al., 2023). This concept includes product innovations such as changes in design, materials, recycling, and life-cycle environmental impacts (Han & Xu, 2021), and process innovations such as energy efficiency, waste reduction, pollution prevention, and cleaner production (Khan et al., 2021). These two dimensions are interrelated because product changes require process adjustments, while cleaner processes can support the development of more environmentally friendly products (Ngo, 2024; Liu et al., 2025).

2.1.3. Green Human Resources Management

Green human resources management refers to a coordinated set of human resources practices designed to incorporate environmental objectives into the processes of selection, development, evaluation, compensation, employee participation, and organizational support for employees (Dumont et al., 2017; Law et al., 2017; Chang et al., 2020; Khatoon et al., 2021; Sabokro et al., 2021; Zhou et al., 2025). From an NRBV perspective, green human resources management can build pollution-prevention capabilities and product responsibility by integrating environmental considerations into recurring organizational routines. From an AMO-based perspective, these practices can support the capabilities, motivation, and opportunities relevant to environmental participation. However, because the AMO dimensions are not measured separately, this explanation remains theoretical and has not been empirically tested as a sequence (Roscoe et al., 2019; Aboramadan et al., 2022; Riaz et al., 2024).

2.1.4. Green Shared Vision

Green shared vision refers to a clear, mutually understood strategic direction for environmental goals and aspirations that organizational members have internalized (Zhao et al., 2023). This concept is characterized by clarity, consensus, collective commitment, and strategic alignment (Chen et al., 2015; Fang et al., 2021; Ma et al., 2023). A green shared vision is a collective organizational vision focused on environmental and ecological conservation (Chang et al., 2019). Within the company, supervisors realize this shared vision by communicating organizational goals to

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subordinates, ensuring the company meets its objectives. More specifically, a green shared vision establishes a clear, inclusive strategic direction that fulfills business objectives while realizing the aspirations embraced by all staff members. Within the NRBV framework, a green shared vision can reduce ambiguity and align organizational actions, directing environmental resources toward achieving these objectives.

2.1.5. Digital Readiness

Digital readiness refers to an organization's readiness to adopt, integrate, and use digital technologies in its business processes, strategies, and organizational culture (Chounta et al., 2024). In organizational studies, digital readiness is not merely about hardware availability; it is a crucial prerequisite for an organization to undertake digital transformation. Without thorough digital readiness, technology investments often fail or are used suboptimally (Chen et al., 2026). In this study, this includes digital infrastructure, employee digital literacy, managerial support, process integration, and the ability to adapt to technological changes (Khin & Ho, 2019; Cancela et al., 2024; Khan et al., 2025; Rizana et al., 2025). These aspects can support eco-innovation by facilitating data collection, resource monitoring, tracking, simulation, process connectivity, and information sharing.

2.2. Hypothesis Development

2.2.1. Green Human Resources Management and Eco-Innovation

According to the NRBV, organizations can build excellence by developing resources and capabilities that support environmental protection (Hart, 1995). Green human resources management can serve as an internal capability by enhancing employees' knowledge, competencies, and engagement in developing more environmentally friendly solutions. This capability helps companies improve products and processes by streamlining operations, minimizing resource use, and generating eco-innovations that can become the company's competitive advantage (Arshad et al., 2025). The AMO perspective reinforces this relationship by positioning green human resources management as a practice that shapes employees' abilities, motivation, and opportunities to contribute to environmental innovation (Appelbaum, 2000). Practices such as environmentally conscious recruitment and training can increase access to knowledge regarding more environmentally friendly materials, recycling, energy efficiency, waste reduction, and cleaner production. Environmental assessments and awards can amplify these outcomes, while employee engagement can provide a channel for incorporating relevant ideas into design and production decisions (Dumont et al., 2017; Khatoon et al., 2021; Sabokro et al., 2021). Previous research has also reported a positive relationship between green human resources management, green innovation, and environmental performance (Singh et al., 2020; Fang et al., 2022; Aftab et al., 2023; Niazi et al., 2023). **H_1: Green Human Resource Management Has a Positive Effect on Eco-Innovation.**

2.2.2. Green Human Resource Management and Green Shared Vision

According to the NRBV, an organization's ability to manage resources and environmental issues underpins organizational advantage (Hart, 1995). From this perspective, green human resources management institutionalizes a common language, shared expectations, and participation regarding environmental priorities through various human resources practices (Hong et al., 2024). This consistency clarifies the organization's environmental direction, fosters a shared understanding and consensus, and strengthens collective commitment and strategic alignment among employees. Therefore, green human resources management can foster a green shared

vision at the organizational level. According to Dumont et al. (2017) and Roscoe et al. (2019), a green shared vision can develop when the organizational system consistently communicates and reinforces environmental priorities through recruitment, training, performance evaluations, rewards, employee engagement, and managerial support. **H_2: Green Human Resource Management Has a Positive Effect on Green Shared Vision.**

2.2.3. Green Shared Vision and Eco-Innovation

Based on the NRBV framework, resources and capabilities that support environmental management can serve as sources of organizational advantage (Hart, 1995). A green shared vision functions as a socio-cognitive coordination resource that can facilitate a shared understanding and direction regarding environmental issues within the organization (Ruan et al., 2022). This shared direction serves as a reference for various organizational functions to coordinate decisions, share knowledge, and evaluate alternatives (Lu et al., 2024), thereby enabling the integration of knowledge into product decisions regarding materials, recycling, and life-cycle impacts, as well as process decisions regarding energy consumption, waste reduction, and pollution prevention. Thus, a green shared vision shapes eco-innovation through the overall innovation process. Previous research links a green shared vision to creativity and innovation-supporting behaviors (Fang et al., 2021; Ma et al., 2023). A green shared vision can also reduce interpretive conflicts by providing a common environmental framework for project selection, knowledge sharing, and evaluating product and process alternatives (Chen et al., 2015; Lu et al., 2024). **H_3: Green Shared Vision Has a Positive Effect on Eco-Innovation.**

2.2.4. Green Human Resources Management and Eco-Innovation: The Mediating Role of a Green Shared Vision

NRBV explains that the organizational resources utilized should help achieve organizational goals (Hart, 1995). Green human resources management emphasizes ecological values and signals environmental objectives (Bindeeba et al., 2025a). This emphasis fosters a shared understanding among organizational members through a green shared vision. Furthermore, this collective vision unifies cross-functional organizational goals, directing environmental knowledge, skills, and attitudes toward developing more environmentally friendly products and processes (Malik et al., 2021). Although green human resources management can directly influence eco-innovation, a shared green vision may mediate this relationship. Without a shared direction, resources such as employees' psychological states, attitudes, and behaviors may remain scattered and fail to achieve the organization's eco-innovation goals (Fang et al., 2021). Green human resources management is often associated with innovation through eco-friendly knowledge, organizational support, climate, culture, and employee behavior (Aboramadan et al., 2022; Fang et al., 2022; Riaz et al., 2024). Thus, this study hypothesizes that green shared vision mediates the relationship between green human resources management and eco-innovation. **H_4: Green Shared Vision Mediates the effect of Green Human Resources Management on Eco-Innovation.**

2.2.5. Green Human Resources Management and Eco-Innovation: The Moderating Role of Digital Readiness

NRBV explains that resources and capabilities that support environmental management can provide a foundation for companies to achieve competitive advantage through eco-innovation (Hart, 1995). Green human resources management provides employees with the skills and autonomy needed to generate environmentally

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friendly solutions that form the basis of innovation within the organization (Bindeeba et al., 2025b). However, the effectiveness of these resources varies across organizations and depends on the organization's readiness to use them (Mamun, 2026). In this context, digital readiness refers to an organization's preparedness to adopt and leverage digital technologies as supporting capabilities (Höyng & Lau, 2023). High digital readiness enables organizations to apply the knowledge and environmental participation built through green human resources management more effectively to develop eco-innovation through access to information, the use of analytical technologies, and process integration (Khin & Ho, 2019; Khan et al., 2025; Rizana et al., 2025). Conversely, limitations in digital readiness, such as skill gaps and resistance to technology (Hanelt et al., 2021; Verhoef et al., 2021), can constrain the use of resources in the innovation process. Thus, digital readiness is hypothesized to moderate the relationship between green human resources management and eco-innovation. **H_5: Digital Readiness Positively Moderates the Relationship Between Green Human Resources Management And Eco-Innovation**

2.2.6. Green Shared Vision and Eco-Innovation: The Moderating Role of Digital Readiness

According to the NRBV, a green shared vision can support eco-innovation as an organizational capability by aligning environmental priorities among organizational members (Hart, 1995; Hasırcı et al., 2024). However, a green shared vision does not always lead to eco-innovation because environmental priorities must translate into actions and innovation processes, such as digital readiness, which signals the organization's operational readiness. When digital readiness is higher, environmental priorities are more easily integrated into monitoring systems, digitally connected workflows, traceability processes, and the redesign of products and processes (Di Maria et al., 2022; Wang & Zhong, 2024; Yang & Liu, 2024), thereby facilitating the transformation of a green shared vision into concrete actions toward eco-innovation. Cheng et al. (2024) explain that limited digital adoption hinders access to and use of data and makes it difficult for organizations to detect operational issues that support innovation. Thus, the higher the digital readiness, the stronger the influence of the green shared vision on eco-innovation. **H_6: Digital Readiness Positively Moderates the Relationship between Green Shared Vision and Eco-Innovation**

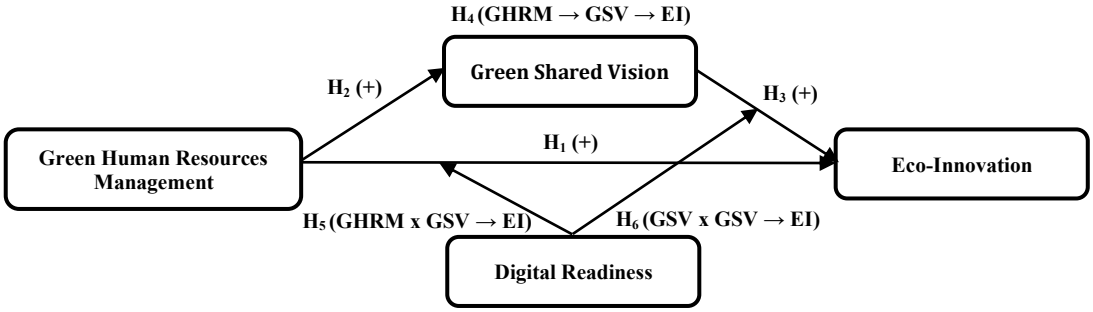


Figure 1. Research Framework

Based on the theoretical framework and hypothesis development, this study examines the relationship between green human resources management and eco-innovation, with a green shared vision as a mediator and digital readiness as a moderator. Solid arrows in Figure 1 represent direct relationships, while dashed arrows represent moderating effects.

3. Research Methods

3.1. Population and Sampling Method

The target population includes supervisors and managers in manufacturing organizations in West Java, East Java, and Batam, Indonesia. These locations were selected to capture contextual variations along major industrial corridors characterized by varying levels of industrial concentration, supply chain exposure, logistics connectivity, and technological development. The study limited respondents to supervisors and managers because these positions expose them to human resources policies, environmental initiatives, digital systems, and operational improvement activities.

The study used purposive sampling because no sample frame of managerial respondents meeting the criteria was available. Respondents had to meet the following inclusion criteria: they work in a manufacturing organization; hold a supervisory, managerial, or executive position; and provide a sufficiently complete response for analysis. These criteria were designed to identify key informants with relevant knowledge and capture contextual heterogeneity, not to produce probability-based estimates representative of the national manufacturing population.

The final analytical sample consisted of 300 usable managerial responses. To assess the adequacy of the sample size, a power analysis was conducted using G*Power 3.1, assuming a moderate effect size of 0.15, an alpha level of 0.05, seven predictors, and a statistical power of 0.95, which resulted in a recommended minimum sample size of 153 (Faul et al., 2009). The final sample exceeded this threshold. However, these calculations serve as a check of analytical adequacy, not a historical basis for respondent recruitment, and do not compensate for the nonprobability sampling design.

3.2. Data Collection Method

Data were collected using a self-administered structured questionnaire, distributed in both electronic and printed formats, employing a 1–5 Likert scale. Before respondents completed the questionnaire, researchers conducted a preliminary screening to ensure they met the research objectives. Participation was voluntary and anonymous, and the analytical dataset contained no identifying information. Respondents were informed that all answers and personal data would be kept confidential and used solely for research purposes. The questionnaire collected managers' assessments of green human resources management, green shared vision, digital readiness, and eco-innovation, along with demographic information regarding region, manufacturing subsector, company size, managerial level, and length of service at the organization. The final dataset included 300 responses used for analysis. Common method bias and perceptual response bias remain possible, because all key constructs were measured using a single self-administered questionnaire. The available research documentation also does not list a formal ethics approval number; therefore, this paper does not claim official committee approval or an exemption. Green human resource management (GHRM), as defined by Dumont et al. (2017), is measured using six indicators; green shared vision (GSV), as defined by Chen et al. (2015), is measured using four indicators; digital readiness (DR), as defined by Khin and Ho (2019), is measured using five indicators; and, finally, eco-innovation (EI), as defined by Cheng and Shiu (2012), is measured using six indicators.

3.3. Data Analysis Method

This study estimated the proposed model using partial least squares structural equation modeling (PLS-SEM) in SmartPLS 4. The reflective measurement model was evaluated for convergent and discriminant validity, reliability, and multicollinearity. Convergent validity was assessed using outer loadings > 0.7 and an average variance extracted (AVE) > 0.5. Cronbach's alpha and composite reliability of at least 0.70 were

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considered adequate for internal consistency. Discriminant validity was evaluated using the Heterotrait–Monotrait Ratio (HTMT), with values below 0.85 interpreted as meeting conservative criteria. Indicator-level collinearity was evaluated using a variance inflation factor (VIF) < 5 (Henseler et al., 2015; Ghozali, 2021; Hair et al., 2021).

The structural model was evaluated sequentially using structural VIF, path coefficients, and the coefficient of determination (R^2). Structural VIF was used to ensure no multicollinearity among the predictor constructs. Path coefficients were applied to assess the direction and magnitude of relationships between constructs. This study examined R-squared to assess the proportion of variance in the endogenous construct explained by its predictor constructs. Finally, hypotheses were tested using a bootstrapping procedure with 5.000 subsamples. A relationship was considered significant if the p-value was < 0.05 and the t-statistic was > 1.96 (Ghozali, 2021). The study also used a 95% confidence interval to support significance inferences, deeming an effect significant if the interval did not include zero.

4. Results and Discussion

4.1. Respondent Demographic Profile

Table 2. Respondent Demographic Profile

Variable	Category	n	%
Region	West Java (Cikarang-Karawang corridor)	131	43.7
	East Java (Surabaya)	106	35.3
	Batam	63	21.0
Subsector	Chemicals	46	15.3
	Electronics	59	19.7
	Textiles	57	19.0
	Automotive & Parts	44	14.7
	Food & Beverage Manufacturing	49	16.3
	Other manufacturing	45	15.0
Firm size	<100 Employees	72	24.0
	100-499 Employees	105	35.0
	500-999 Employees	58	19.3
	1000+ Employees	65	21.7
Managerial level	Supervisor / Team lead	86	28.7
	Middle manager	117	39.0
	Senior manager	65	21.7
	Director+ / Executive	32	10.6
Tenure (years)	1-5 years	85	28.3
	6-10 years	122	40.7
	11-15 years	76	25.3
	16+ years	17	5.7

This analysis involved 300 managerial-level respondents from three major manufacturing corridors in Indonesia. As shown in Table 1, most respondents were from West Java, accounting for 43.7% of the total. Most respondents were from the electronics subsector, which accounted for 19.7% of the total. The sample also included companies of various sizes and respondents from various managerial levels. Most respondents had sufficient organizational experience, with 71.7% reporting more than five years of tenure

with their organization. This demographic heterogeneity broadens the sample's contextual scope across manufacturing environments with differing organizational and technological characteristics.

4.2. Measurement Model Assessment

Table 2. Validity, Reliability, and Collinearity

Construct	Outer Loading	VIF	Cronbach's Alpha	Composite Reliability	AVE
Green Human Resource Management			0.926	0.942	0.730
GHRM1	0.833	2.368			
GHRM2	0.859	2.666			
GHRM3	0.853	2.631			
GHRM4	0.879	3.043			
GHRM5	0.852	2.561			
GHRM6	0.852	2.642			
Green Shared Vision			0.906	0.934	0.779
GSV1	0.889	2.722			
GSV2	0.867	2.403			
GSV3	0.887	2.700			
GSV4	0.889	2.802			
Digital Readiness			0.891	0.914	0.680
DR1	0.786	2.542			
DR2	0.797	2.196			
DR3	0.815	2.019			
DR4	0.864	2.209			
DR5	0.860	2.083			
Eco-Innovation			0.899	0.922	0.665
EI1	0.839	2.347			
EI2	0.801	2.038			
EI3	0.804	1.960			
EI4	0.795	1.964			
EI5	0.820	2.246			
EI6	0.832	2.354			

Figure 2 and Table 2 summarize all outer model values. Based on the test results, all outer loadings (>0.7) and average values (>0.5) meet the criteria for convergent validity (Ghozali, 2021). In the reliability test, all variables had Cronbach's alpha and composite reliability values > 0.7, meeting Ghozali's (2021) criteria. Furthermore, VIF values ranged from 1.960 to 3.043, indicating no multicollinearity issues at the indicator level (Hair et al., 2021).

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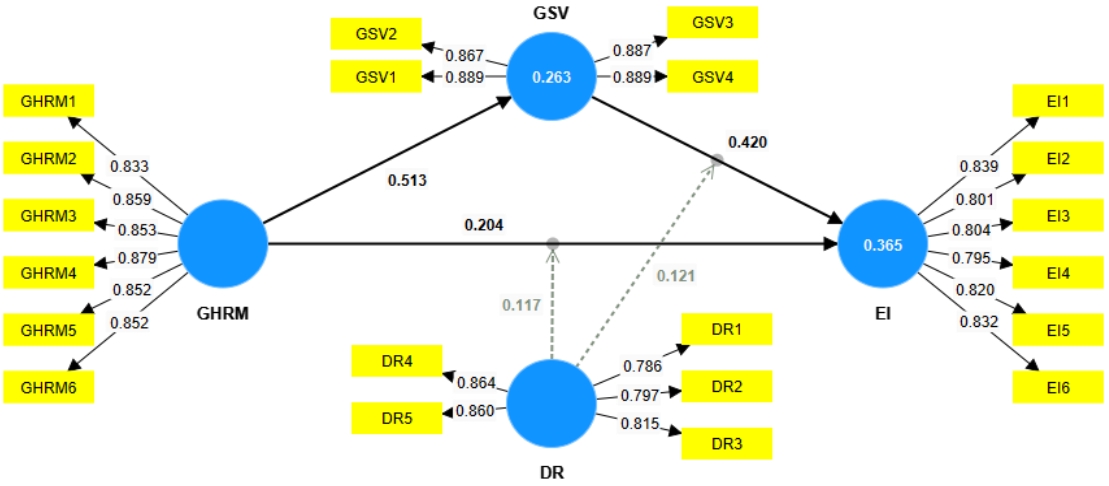


Figure 2. Measurement Model

Table 3 presents the discriminant validity results, as evaluated using the HTMT score. Henseler et al. (2015) recommend an HTMT value below 0.85 to meet discriminant validity. All HTMT ratios ranged from 0.014 to 0.587 and were below the conservative threshold of 0.85, thus meeting the criteria for discriminant validity.

Table 3. HTMT Ratio

Construct	DR	EI	GHRM	GSV	DR x GSV	DR x GHRM
DR						
EI	0.106					
GHRM	0.167	0.469				
GSV	0.082	0.587	0.559			
DR x GSV	0.054	0.213	0.026	0.029		
DR x GHRM	0.052	0.199	0.014	0.020	0.553	

4.3. Structural Model

The structural VIF results in Table 4 show inner VIF values ranging from 1.000 to 1.444. These values are below the 5 threshold, indicating no structural multicollinearity.

Table 4. Inner-Model Collinearity Assessment

Endogenous Construct	Predictor	Inner VIF
GSV	GHRM	1.000
EI	GHRM	1.384
EI	GSV	1.360
EI	DR	1.027
EI	DR × GHRM	1.442
EI	DR × GSV	1.444

Based on Table 5, the structural model explains 26.3% of the variance in green shared vision and 36.5% of the variance in eco-innovation. These values indicate that the model has good explanatory power, although other factors outside the model still influence green shared vision and eco-innovation.

Table 5. R-Squared

Endogenous Construct	R^2
Green Shared Vision	0.263
Eco-Innovation	0.365

Hypothesis testing used a bootstrapping procedure, with acceptance criteria of $p < 0.05$ and $t > 1.96$ (Ghozali, 2021), and a 95% confidence interval that does not include zero. Based on Table 6, all hypotheses were supported except the fifth. The interaction between digital readiness and green human resources management on eco-innovation is not statistically significant ($t = 1.811$; $p = 0.070$) with a confidence interval of (-0.040 to 0.229), so the fifth hypothesis is not supported.

Table 6. Hypothesis Testing Results

Path / Effect	Original Sample (O)	Sample Mean (M)	STDEV	T Statistics	P Values
Green Human Resource Management → Eco-Innovation	0.204	0.203	0.054	3.802	<0.001
Green Human Resource Management → Green Shared Vision	0.513	0.514	0.044	11.593	<0.001
Green Shared Vision → Eco-Innovation	0.420	0.420	0.051	8.315	<0.001
Green Human Resource Management → Green Shared Vision → Eco-Innovation	0.216	0.216	0.032	6.731	<0.001
Green Human Resource Management x Digital Readiness → Eco-Innovation	0.117	0.112	0.065	1.811	0.070
Green Shared Vision x Digital Readiness → Eco-Innovation	0.121	0.109	0.059	2.066	0.039

4.4. Discussion

4.4.1. Green Human Resource Management and Eco-Innovation

This study shows that green human resource management positively influences eco-innovation. From the NRBV perspective, green human resource management builds organizational resources and routines that support environmentally oriented human resource management and can then be leveraged to achieve organizational goals (Hart, 1995; Niazi et al., 2023). These practices foster human resources capable of generating ideas and implementing new environmental practices, thereby supporting eco-innovation at the organizational level (Correia et al., 2024). The AMO perspective complements this explanation by showing that practices such as recruitment, training, evaluation, and rewards develop employees' knowledge and capabilities that can drive corporate processes and innovations in environmentally friendly products or processes (Appelbaum et al., 2000; Munawar et al., 2022). For manufacturing companies, integrating environmental objectives from recruitment through day-to-day human resources management is crucial to ensure human resources are directed toward developing eco-innovation. These findings align with those of Kuo et al. (2022) and Rana and Arya (2023), which highlight the important role of green human resources management in enhancing eco-innovation.

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4.4.2. Green Human Resource Management and Green Shared Vision

This study found that green human resources management positively affects green shared vision. These results align with the NRBV, which explains that organizational resources are more effective when coordinated to support the organization's environmental goals (Hart, 1995). Green human resources management integrates environmental values from recruitment through employee management, ensuring that messages about environmental priorities are repeatedly communicated to organizational members (Hameed et al., 2022). This consistency helps employees understand the organization's environmental direction and align their perceptions of the goals to be achieved, thereby forming a shared green vision (Qamar et al., 2022). In manufacturing, aligning environmental messages and targets through human resources practices is crucial for building a consistent environmental understanding across functions. Qamar et al. (2022) explain that the more environmentally friendly an organization's human resources practices are, the more employees' environmentally conscious "green shared vision" can align with environmental requirements. Dumont et al. (2017) add that green human resources management can influence environmental behavior through a shared psychological context, rather than solely through direct individual responses.

4.4.3. Green Shared Vision and Eco-Innovation

Hypothesis testing results reveal the role of green shared vision in enhancing eco-innovation development within organizations. Ruan et al. (2022) explain that a cross-functional green shared vision enhances organizational members' learning capabilities, making innovation practices more likely. Chen et al. (2014) noted that a green shared vision fosters trust among members, facilitating the identification, adoption, and integration of various skills for eco-innovation. These findings are based on the NRBV framework, which explains that environmental capabilities and resources are more effective when directed and coordinated to achieve the organization's environmental goals (Hart, 1995). In manufacturing companies, an environmental vision consistently understood across organizational functions enables members to see broader interconnections between processes, facilitating coordination for product and process improvements (Chang et al., 2019). These conditions ultimately support eco-innovation, as this study found.

4.4.4. Green Human Resources Management and Eco-Innovation: The Mediating Role of Green Shared Vision

This study found that green shared vision mediates the relationship between green human resources management and eco-innovation. This mediation finding builds on previous research showing that human resource practices often operate through social, cognitive, and organizational processes. Examples include the psychological green climate (Dumont et al., 2017) and green organizational culture (Roscoe et al., 2019). This study expands on that reasoning by positioning the green shared vision as another mechanism that enables managers to link green human resources management with eco-innovation. From the NRBV perspective, green human resources management provides resources and practices that direct the organization's attention toward environmental goals (AlKetbi & Rice, 2024; Hart, 1995). These practices foster a shared understanding of environmental priorities and give organizational members clear direction (Qamar et al., 2022). The NRBV further explains that a green shared vision helps coordinate resources, knowledge, and efforts among members, making it easier to direct them toward developing eco-innovation. Thus, manufacturing organizations must not only implement environmentally

oriented human resources management practices but also ensure that every member's understanding of the environmental direction is aligned so that it can be effectively coordinated to generate innovation.

4.4.5. Green Human Resources Management and Eco-Innovation: The Moderating Role of Digital Readiness

The research findings do not support a moderating effect of digital readiness on the relationship between green human resources management and eco-innovation. This finding can be understood through the socio-technical systems perspective, which emphasizes that technology effectiveness depends on the compatibility and integration between an organization's technical and social systems (Trist & Bamforth, 1951). Green human resources management, as a social aspect, and digital readiness, as a technical aspect, do not automatically create synergy if technology is not integrated into work processes and organizational needs. This condition is relevant to the sample composition, which is dominated by companies with fewer than 500 employees (59.0%) and may have limited financial resources, specialized digital expertise, system integration, formalization, and the capacity to coordinate cross-functional technology investments within the organization. Hanelt et al. (2021) explain that digital transformation is a systemic change process, so its benefits depend on organizational readiness and integration, not merely the presence of technology. Other studies also indicate that digital technology's environmental impact depends on organizational integration and the type of technology used (Di Maria et al., 2022; Nureen et al., 2023).

4.4.6. Green Shared Vision and Eco-Innovation: The Moderating Role of Digital Readiness

Finally, this study found that digital readiness strengthens the relationship between a shared green vision and eco-innovation. This finding suggests that digital technology can facilitate information processing, connectivity, monitoring, and coordination, but its impact depends on how these technologies integrate with other capabilities and processes (Hanelt et al., 2021). From the NRBV perspective, a shared green vision and digital readiness can serve as complementary resources that support an organization's environmental goals (Hart, 1995). When digital readiness is higher, organizations can process information, monitor activities, and coordinate processes digitally, making it easier to translate the mutually agreed-upon environmental direction into concrete eco-innovation actions. For manufacturing companies, increasing digital readiness must go hand in hand with established environmental priorities so technology can implement eco-innovation. These findings expand our understanding that a green shared vision's influence on eco-innovation depends on conditions that support its implementation.

5. Conclusion

This study examines how green human resources management relates to eco-innovation, with green shared vision as a mediator and digital readiness as a moderator, in Indonesian manufacturing companies. The statistical results indicate that green human resources management is positively associated with eco-innovation, both directly and indirectly through green shared vision. Digital readiness does not significantly influence the direct relationship between green human resources management and eco-innovation. Conversely, it plays a conditional role in the relationship between green shared vision and eco-innovation. Theoretically, this study clarifies digital readiness's role in the green human resources management mechanism leading to eco-innovation. NRBV provides a theoretical

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foundation for why coordinated environmental resources and organizational alignment matter for eco-innovation. At the same time, AMO theory helps explain why environmentally oriented human resources practices can create conditions that support employee capabilities, motivation, and participation. The findings indicate that the green shared vision partially mediates the influence of green human resources management (as perceived by managers) on eco-innovation. At the same time, digital readiness appears to influence the strength of the green human resources management-eco-innovation pathway.

These findings also have practical relevance for manufacturing managers. Environmentally friendly human resource practices, shared environmental priorities, and digital capabilities should not be viewed as standalone organizational initiatives. The research suggests that digital readiness may be more beneficial when it supports the implementation of mutually agreed-upon environmental policy directions, rather than when it is expected to strengthen environmentally friendly human resource practices automatically. Therefore, managers may consider aligning digital investments with clearly defined environmental priorities and cross-functional sustainability goals. For example, environmental dashboards, digital traceability, production analytics, or digital monitoring of environmental targets can support such alignment.

The study's conclusions remain limited by its design and empirical context. The data are cross-sectional and based on managerial respondents' individual perceptions, making it impossible to draw strong conclusions about temporal dynamics or causality, and they do not provide an objective, company-level assessment of organizational capabilities. The study used a purposive sample of manufacturing companies across three Indonesian industrial corridors, including companies of various sizes and subsectors. Therefore, these findings cannot be statistically generalized to the entire Indonesian manufacturing population. Future research should use a longitudinal design, include more informants, distinguish between product and process eco-innovation, and examine whether the conditional role of digital readiness varies by firm size, manufacturing subsector, regional infrastructure, level of digital maturity, or type of technology. Future research would help determine whether the specific pathway patterns identified in this study reflect broader constraints in green and digital transformation, or whether these patterns depend on the organizational context examined in this study.

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