

Orchestrating Green HRM and Green Marketing Capability through Green Innovation for Sustainable Marketing Performance: An East Java SME Framework

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Abstract: Sustainable marketing performance in small and medium-sized enterprises (SMEs) requires coordination between internal employee systems and external market-facing capabilities. This conceptual and methodological paper develops a capability-orchestration framework linking green human resource management (GHRM), green marketing capability (GMC), green innovation (GI), and sustainable marketing performance (SMP) in the context of East Java SMEs. The natural-resource-based view identifies the strategic value of environmentally oriented resources; the ability-motivation-opportunity perspective explains how GHRM builds employee ability, motivation, and opportunity; and dynamic-capability logic explains how GMC senses and responds to green market change. GI is proposed as the shared conversion mechanism that combines these capabilities into market-relevant environmental improvements. To demonstrate the instrument architecture and the PLS-SEM workflow rather than to test empirical relationships, the paper employs a transparent synthetic dataset consisting of 250 simulated cases and 21 reflective indicators. The simulation produces internally consistent reliability, validity, structural path, mediation, and predictive results. However, no actual owner-managers or SMEs were surveyed, and the numerical results should not be interpreted as empirical evidence for East Java SMEs. The contribution is therefore theoretical and methodological: it specifies capability orchestration across HR, marketing, and innovation domains, distinguishes SMP from broad firm-performance outcomes, and provides an empirically testable instrument and analysis protocol for future field research. Any managerial or policy implications remain conditional on validation with genuine field data.

Keywords: *Green HRM, green marketing capability, green innovation, sustainable marketing performance, capability orchestration, SMEs*

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INTRODUCTION

Small and medium-sized enterprises face a dual sustainability challenge. They must reduce the environmental burden of their operations while continuing to create customer value, protect revenue, and maintain market relevance. This challenge is especially important in emerging economies, where SMEs collectively generate substantial employment and production but commonly operate with limited finance, specialized personnel, and environmental technology. East Java provides a strategically relevant setting because its official micro- and small-industry profile documents wide sectoral variation in business scale, labor, capital, internet use, innovation support, and marketing



distribution (BPS-Statistics Indonesia, East Java Province, 2025). Consequently, sustainable transformation cannot rely only on cleaner production. It also requires employees who can execute environmental priorities and marketing capabilities that can translate environmental value into credible market outcomes.

Recent evidence demonstrates that green innovation can improve SME performance, market outcomes, and resilience. Green innovation enables firms to redesign products, processes, packaging, and resource use in ways that lower environmental impact and can also strengthen customer value (Rustiarini et al., 2022; Zheng et al., 2022). Studies of SMEs further indicate that innovation capability, technological orientation, stakeholder pressure, and green dynamic capabilities shape whether environmental ideas are converted into measurable performance (Alraja et al., 2022; Khan et al., 2024; Singh et al., 2022). Yet green innovation is not self-generating. It depends on organizational systems that develop knowledge and motivation internally and on market-facing capabilities that identify, communicate, and capture demand for greener offerings.

Green human resource management (GHRM) integrates environmental objectives into recruitment, training, performance appraisal, rewards, participation, and leadership communication. Through the ability–motivation–opportunity logic, GHRM develops employees' environmental knowledge, motivates pro-environmental action, and creates opportunities for participation in improvement initiatives. Empirical studies show that GHRM is associated with green creativity, employee green innovative behavior, green human capital, environmental performance, and sustainable performance (Abualigah et al., 2023; Aftab et al., 2023; Kuo et al., 2022; Ogiemwonyi et al., 2023; Song et al., 2023). Evidence from manufacturing and service contexts also suggests that the effects of GHRM become stronger when environmental strategy, technology, knowledge sharing, and organizational support are aligned (Aftab & Veneziani, 2024; Makumbe, 2024; Parida et al., 2023; Trujillo-Gallego et al., 2022).

Green marketing capability (GMC), by contrast, represents a firm's ability to sense environmentally oriented customer needs, design a credible green value proposition, communicate environmental claims, coordinate green channels and content, and adapt marketing actions to changing sustainability expectations. A green marketing capability is more than occasional promotion. It is an embedded market-sensing and market-response capability that links environmental attributes to customer benefits and competitive positioning. Research on green marketing orientation shows that strategic and tactical green marketing dimensions can stimulate green innovation and organizational performance, while green marketing innovation can enhance the financial return from green product innovation (Appiah & Essuman, 2024; Negi et al., 2023). Thus, GHRM and GMC represent complementary sides of organizational capability: GHRM mobilizes internal human resources, whereas GMC connects environmental value creation with external markets.

Despite rapid growth in green management research, three gaps remain. First, GHRM and green marketing are often modeled in separate research streams, even though resource-constrained SMEs must coordinate employee systems and market actions. Second, many studies rely on broad outcomes such as environmental performance, organizational performance, firm performance, or triple-bottom-line performance (Ahmed et al., 2023; Al-Shammari et al., 2022; Liu et al., 2024; Zhou et al., 2024). Sustainable marketing performance is more specific because it combines sales, customer satisfaction, loyalty, brand position, and achievement of marketing objectives with an

environmentally responsible value proposition. Third, green innovation has been examined as a mediator in GHRM–performance models, but less attention has been given to how the same mechanism coordinates internal green people capability and external green marketing capability within one SME framework (Aftab et al., 2023; Bahmani et al., 2023; Makumbe, 2024; Zhang et al., 2024).

This paper addresses these gaps through a capability-orchestration argument rather than a simple combination of predictors. The natural-resource-based view explains why environmentally oriented human, market, and innovation resources may be strategically valuable. The ability–motivation–opportunity perspective supplies the employee-level microfoundations by explaining how GHRM develops environmental ability, motivates discretionary action, and creates opportunities to participate. Dynamic-capability reasoning explains how GMC senses changes in green demand, seizes market opportunities, and reconfigures products, processes, messages, and channels. GI connects these levels by combining employee knowledge, market intelligence, environmental know-how, and cross-functional routines into observable improvements. The paper therefore develops seven research propositions and an analytical protocol for future empirical validation in East Java SMEs; it does not claim that the synthetic illustration represents actual firms or respondents.

Building on this integrated rationale, GHRM should promote green innovation because green recruitment attracts environmentally sensitive employees, green training provides technical and behavioral knowledge, green performance appraisal clarifies expectations, and green rewards reinforce experimentation. Employees are more likely to generate and implement environmentally beneficial ideas when these practices are mutually reinforcing. Recent studies report positive links between GHRM and green innovation, green creativity, and green innovative behavior across SMEs, manufacturing, hospitality, and education settings (Aftab et al., 2023; Bahmani et al., 2023; Kuo et al., 2022; Song et al., 2023). Zhang et al. (2024) further show that product and process green innovation transmit the effect of GHRM to green competitive advantage. Accordingly, Proposition 1 (P1) states that green human resource management is positively associated with green innovation.

Green marketing capability should also stimulate green innovation. Market sensing reveals unmet demand for environmentally safer products, packaging, and delivery. Green value-proposition design helps firms prioritize product attributes that customers understand and value, while credible communication requires operational evidence that encourages process and product improvements. Negi et al. (2023) demonstrate that green marketing orientation dimensions affect green innovation and performance, and Appiah and Essuman (2024) show that green marketing innovation conditions the economic value of green product innovation. Green marketing capability therefore directs innovation toward market-relevant environmental solutions. On this basis, Proposition 2 (P2) states that green marketing capability is positively associated with green innovation.

GHRM can directly affect sustainable marketing performance because employees influence service quality, customer communication, process consistency, and brand credibility. Environmental training and participation can reduce errors and waste, while values-based recruitment and performance systems improve the consistency between environmental promises and actual delivery. This consistency can strengthen reputation, trust, and loyalty. Studies link GHRM with sustainable, environmental, and organizational outcomes through employee behavior, human capital, and organizational image (Aftab & Veneziani, 2024; Ogiemwonyi et al., 2023; Papademetriou et al., 2023; Parida et al., 2023).

Therefore, Proposition 3 (P3) states that green human resource management is positively associated with sustainable marketing performance.

Green marketing capability should directly improve sustainable marketing performance by enabling SMEs to identify environmentally responsive segments, communicate benefits without unsupported claims, and adapt offerings as customer expectations evolve. Prior evidence links green marketing orientation and green marketing innovation to organizational and financial outcomes (Appiah & Essuman, 2024; Negi et al., 2023). Consequently, Proposition 4 (P4) states that green marketing capability is positively associated with sustainable marketing performance.

Green innovation is expected to improve sustainable marketing performance because environmentally improved products and processes strengthen a firm's green value proposition. They enhance brand legitimacy and improve customer satisfaction. Studies of SMEs report positive relationships between green innovation and market performance, firm performance, competitive advantage, and sustainable performance (Alraja et al., 2022; Liu et al., 2024; Novitasari & Tarigan, 2022; Rustiarini et al., 2022; Suki et al., 2023; Zheng et al., 2022). Thus, Proposition 5 (P5) states that green innovation is positively associated with sustainable marketing performance.

The effects of GHRM and green marketing capability on marketing outcomes may also operate through green innovation. GHRM provides skills, motivation, and participation, whereas green marketing capability provides market intelligence. Green innovation translates these capabilities into environmentally improved products, processes, and credible communication. Recent studies support green innovation as a mechanism connecting GHRM, corporate responsibility, and environmental or sustainable performance (Al-Shammari et al., 2022; Aftab et al., 2023; Makumbe, 2024; Zhou et al., 2024). Accordingly, Proposition 6 (P6) states that green innovation mediates the relationship between green human resource management and sustainable marketing performance, while Proposition 7 (P7) states that green innovation mediates the relationship between green marketing capability and sustainable marketing performance.

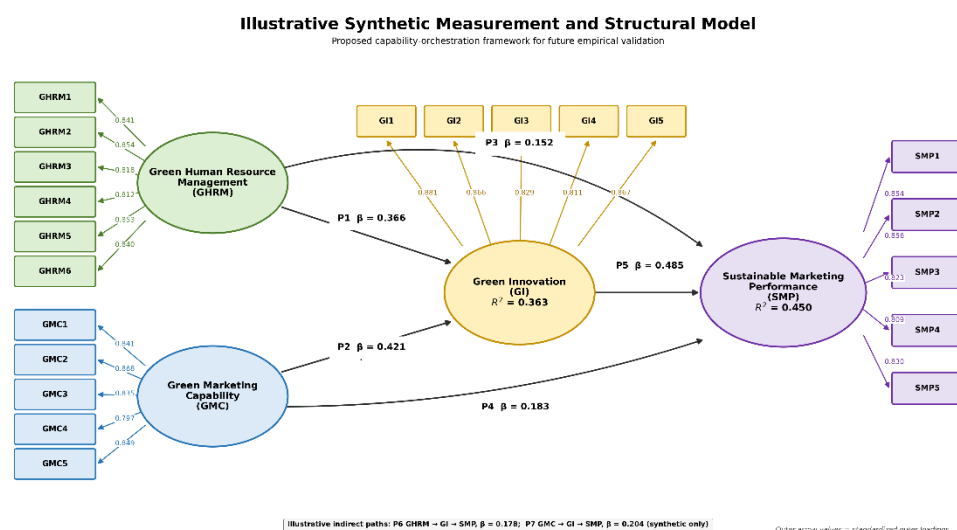


Figure 1. Proposed capability-orchestration model with illustrative synthetic loadings, path coefficients, and R^2 values

Note: Every numerical value in the figure is generated solely to demonstrate the proposed measurement architecture and analytical workflow; it is not an empirical estimate for East Java SMEs.

RESEARCH METHODS

Conceptual Design and Synthetic-Data Illustration

This paper combines theory-driven conceptual model development with a transparent methodological illustration. The SME is the intended future unit of analysis, and the intended respondent is an owner or senior manager who understands human-resource, marketing, innovation, and performance activities. The proposed model contains two exogenous constructs (GHRM and GMC), one mediating construct (GI), and one final outcome construct (SMP). PLS-SEM is proposed for future field testing because the framework emphasizes prediction, simultaneous direct and indirect relationships, and latent constructs measured by multiple indicators (Hair & Alamer, 2022; Sarstedt et al., 2023; Sarstedt & Liu, 2024). The present paper does not conduct an empirical test of East Java SMEs.

For instrument development, software verification, and analytical demonstration, the paper uses a synthetic dataset of 250 simulated cases. The values were generated to reproduce plausible five-point Likert response structures, indicator reliability, interconstruct correlations, and mediation patterns. No real individuals or firms were surveyed. Accordingly, the outputs can be used to inspect whether the 21-item instrument and PLS-SEM workflow behave coherently, but they cannot establish population parameters, validate the propositions, or justify substantive claims about East Java SMEs. Genuine field data are a prerequisite for any empirical version of the study.

Proposed Measurement Architecture

All four constructs are specified as reflective measurement models in the proposed instrument. Figure 1 displays the 21 indicators together with synthetic standardized loadings, path coefficients, and coefficients of determination solely as a worked analytical example. GHRM is represented by six indicators, whereas GMC, GI, and SMP are each represented by five indicators. Items are scored from 1 (strongly disagree) to 5 (strongly agree). Before field use, the wording should undergo expert review, cognitive interviewing, and pilot testing with SME owner-managers.

Table 1. Construct operationalization

Construct	Role	Items	Main content	Scale
GHRM	Exogenous	6	Recruitment, training, appraisal, rewards, participation, leadership communication	Likert 1–5
GMC	Exogenous	5	Green customer insight, value proposition, communication, channels/content, adaptation	Likert 1–5
GI	Mediator	5	Green product/service, resource efficiency, cleaner process, packaging, continuous improvement	Likert 1–5
SMP	Endogenous	5	Sales, satisfaction, loyalty, brand position, responsible marketing goals	Likert 1–5

Illustrative Analysis Procedure

The proposed empirical analysis follows a two-stage procedure. First, a reflective measurement model would be evaluated using indicator loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE), and the heterotrait–monotrait ratio (HTMT). Loadings close to or above 0.708, reliability values between 0.70 and 0.95, AVE above 0.50, and HTMT below 0.85 or 0.90 are commonly used as diagnostic criteria (Cheung et al., 2024). Second, the structural model would be examined using inner

variance inflation factors (VIF), standardized path coefficients, 5,000-subsample bootstrapping, confidence intervals, R^2 , f^2 , Q^2_{predict} , and specific indirect effects. In this paper, the procedure is applied only to synthetic data to demonstrate workflow and arithmetic consistency. None of the resulting values is treated as empirical validation or hypothesis evidence (Sarstedt & Moisescu, 2024).

RESULTS AND DISCUSSION

Illustrative Measurement-Model Output

Within the synthetic illustration, indicator loadings exceed 0.79, Cronbach's alpha ranges from 0.891 to 0.914, composite reliability ranges from 0.920 to 0.933, and AVE ranges from 0.697 to 0.724. These values show that the generated dataset reproduces the intended internal-consistency and convergent-validity pattern. They do not empirically validate the items, because no actual SME respondents supplied the data. The 21 indicators should therefore be regarded as a proposed instrument awaiting expert, pilot, and field validation

Table 2. Illustrative synthetic measurement-model output

Construct	Indicators	Loading range	Cronbach's α	Composite reliability	AVE
GHRM	6	0.812–0.854	0.914	0.933	0.700
GMC	5	0.797–0.868	0.894	0.922	0.703
GI	5	0.811–0.881	0.904	0.929	0.724
SMP	5	0.809–0.856	0.891	0.920	0.697

The synthetic HTMT matrix also reproduces a discriminant-validity pattern: the highest value is 0.711 for GI and SMP, while the remaining ratios are below 0.54. This pattern is useful for checking that the simulated constructs are distinguishable in the worked example. It does not demonstrate discriminant validity among actual East Java SMEs; that assessment must be repeated with genuine responses

Table 3. Illustrative synthetic HTMT ratios

Construct	GHRM	GMC	GI	SMP
GHRM	—			
GMC	0.185	—		
GI	0.480	0.535	—	
SMP	0.437	0.494	0.711	—

Illustrative Structural-Model Output

In the synthetic illustration, inner VIF values range from 1.029 to 1.569. The generated structural pattern is directionally consistent with all seven propositions: GHRM→GI ($\beta = 0.366$), GMC→GI ($\beta = 0.421$), GHRM→SMP ($\beta = 0.152$), GMC→SMP ($\beta = 0.183$), and GI→SMP ($\beta = 0.485$). The bootstrapped t values, p values, and confidence intervals report the behavior of the simulated dataset only. They must not be described as support for the propositions or as evidence about actual SMEs.

Table 4. Illustrative structural paths and indirect effects from synthetic data

P	Path	β	SE	t	p	95% CI	Data
P1	GHRM $\rightarrow$ GI	0.366	0.047	7.853	<0.001	[0.272, 0.457]	Synthetic
P2	GMC $\rightarrow$ GI	0.421	0.047	8.993	<0.001	[0.326, 0.508]	Synthetic
P3	GHRM $\rightarrow$ SMP	0.152	0.053	2.847	0.004	[0.046, 0.256]	Synthetic
P4	GMC $\rightarrow$ SMP	0.183	0.056	3.280	0.001	[0.073, 0.293]	Synthetic
P5	GI $\rightarrow$ SMP	0.485	0.054	9.053	<0.001	[0.376, 0.585]	Synthetic
P6	GHRM $\rightarrow$ GI $\rightarrow$ SMP	0.178	0.031	5.730	<0.001	[0.120, 0.240]	Synthetic
P7	GMC $\rightarrow$ GI $\rightarrow$ SMP	0.204	0.032	6.320	<0.001	[0.141, 0.268]	Synthetic

The synthetic indirect paths are GHRM $\rightarrow$ GI $\rightarrow$ SMP ($\beta = 0.178$) and GMC $\rightarrow$ GI $\rightarrow$ SMP ($\beta = 0.204$). The arithmetic matches the products of the component paths, and the corresponding direct paths remain positive in the simulation. This demonstrates that the analytical specification can represent complementary partial mediation. It does not establish that mediation occurs in the East Java SME population.

The simulated model produces R^2 values of 0.363 for GI and 0.450 for SMP, with positive Q^2_{predict} values and the illustrative f^2 values reported in Table 5. These indices are retained as a reproducible software and model-feasibility check. Population-level explanatory power and predictive performance remain unknown until the framework is tested with genuine field data and an appropriate holdout or cross-validation procedure.

Table 5. Illustrative predictive indices and effect sizes from synthetic data

Endogenous construct	R^2	Q^2_{predict}	Predictor	f^2
GI	0.363	0.351	GHRM	0.205
GI			GMC	0.270
SMP	0.450	0.432	GHRM	0.034
SMP			GMC	0.046
SMP			GI	0.272

Conceptual Discussion: Capability Orchestration

The framework proposes that GHRM supplies the employee-level microfoundations of green innovation. Recruitment and training build environmental ability; appraisal and rewards strengthen motivation; and participation and leadership communication create opportunities to contribute. In SMEs that often lack formal R&D units, these mutually reinforcing routines can make employee knowledge and daily problem solving important inputs to environmental improvement. This argument is consistent with prior research linking GHRM to green creativity, innovative behavior, environmental performance, and competitive advantage (Aftab et al., 2023; Bahmani et al., 2023; Kuo et al., 2022; Zhang et al., 2024).

GMC contributes a different but complementary function: it senses environmentally oriented demand, interprets customer trade-offs, develops credible value propositions, and adapts communication and channels. Market intelligence helps direct scarce SME innovation resources toward environmental attributes that customers can understand and value. The framework therefore differs from models in which green marketing is treated mainly as promotional activity; GMC is conceptualized here as a market-sensing

and market-response capability that shapes innovation priorities (Appiah & Essuman, 2024; Negi et al., 2023).

Capability orchestration occurs through routines that combine these internal and external inputs. Employee environmental knowledge, operational experience, customer insight, environmental claims, and technological options must be selected, bundled, and deployed across functions. GI is therefore not merely a statistical mediator. It is the organizational conversion arena in which people capability and market capability become cleaner processes, improved products or services, reduced-waste packaging, and evidence that can substantiate marketing claims. This interpretation moves the framework beyond isolated green practices toward coordinated capability development.

SMP is positioned as a distinct outcome because it requires environmental responsibility to be translated into customer, brand, sales, loyalty, and marketing-goal outcomes. Broad measures of firm or environmental performance do not necessarily capture this market-facing combination. The model proposes that GHRM and GMC may have direct pathways to SMP through employee behavior and market execution, while GI provides a tangible link between environmental promise and operational reality (Alraja et al., 2022; Rustiarini et al., 2022; Suki et al., 2023; Zheng et al., 2022).

The synthetic coefficients should be read only as a diagnostic demonstration that the proposed measurement and structural architecture can be estimated without obvious arithmetic inconsistency. Their magnitude, significance, mediation form, and predictive relevance are researcher-generated and may differ materially when genuine responses are collected. The conceptual contribution therefore rests on the orchestration logic and the testable propositions, not on the simulated numerical pattern.

Theoretical and Methodological Contributions

The first contribution is a cross-functional capability-orchestration explanation. Existing GHRM–green innovation models primarily explain how internal employee systems generate environmental outcomes, while green marketing models primarily explain market orientation, communication, or performance. This framework specifies how GHRM and GMC perform different roles within one process: GHRM builds the ability, motivation, and opportunity to generate environmental improvements; GMC senses and directs market-relevant environmental priorities; and GI bundles and deploys both sets of resources. The novelty is therefore not the mere inclusion of familiar constructs, but the specification of their coordinated roles and routines.

The second contribution is the use of SMP as a focused outcome that integrates customer, brand, sales, loyalty, and environmentally responsible marketing goals rather than relying on generic firm performance. The third is methodological: the paper provides a 21-indicator measurement architecture, a transparent PLS-SEM workflow, and explicit boundaries between simulation and evidence. The framework is consequently offered as a testable template for future SME research, not as a validated account of East Java firms.

Conditional Managerial and Policy Propositions

If field data confirm the proposed relationships, SME managers could treat GHRM and GMC as a coordinated development system rather than as separate HR and marketing programs. Recruitment, training, appraisal, participation, market research, claim verification, and customer communication could then be connected through cross-functional green innovation routines. For example, a periodic employee–customer insight review could be piloted to connect operational ideas with market evidence. These actions

are theoretically inferred possibilities, not recommendations validated by the synthetic dataset.

Likewise, if empirical studies reproduce the framework, policy makers, SME associations, universities, and business-support organizations could evaluate integrated programs combining green skills, innovation coaching, market research, responsible environmental communication, and access to shared testing or packaging resources. Program adoption should depend on field evidence about sectoral needs, implementation costs, institutional support, and measurable outcomes. The present paper does not provide an empirical basis for policy prescription in East Java.

Limitations and Future Empirical Research

The decisive limitation is the absence of field data. A synthetic dataset can verify code, illustrate model behavior, and expose instrument or specification problems, but it cannot establish construct validity, effect magnitude, statistical significance, predictive performance, or practical relevance in a population. The model also remains cross-sectional and respondent-reported in its proposed form, creating potential common-method and causal-inference limitations. Any empirical study should use a documented sampling frame, report respondent and firm profiles, test nonresponse and common-method bias, and consider sector, firm size, firm age, certification, digital capability, and environmental intensity as controls.

Future research should first collect genuine responses from East Java SME owner-managers using proportional or stratified sampling where a reliable frame is available. Longitudinal or time-lagged studies are needed to examine how capabilities accumulate and are reconfigured over time. Environmental turbulence and institutional support should be tested as boundary conditions; manufacturing–service and district comparisons can assess heterogeneity; cross-country research can evaluate institutional generalizability; and multilevel designs can connect employee green behavior, firm routines, and market outcomes. Qualitative process studies could also observe how orchestration routines emerge, fail, or become embedded, while field experiments or intervention studies could evaluate whether integrated HR–marketing programs cause measurable change.

CONCLUSION AND RECOMMENDATIONS

This paper develops and analytically illustrates—rather than empirically tests—a framework linking GHRM, GMC, GI, and SMP. Its central proposition is that sustainable marketing performance may depend on capability orchestration: GHRM builds employee ability, motivation, and opportunity; GMC senses and directs environmentally relevant market priorities; and GI converts these complementary resources into improvements that customers can recognize and trust.

The theoretical contribution lies in explaining coordinated roles across HR, marketing, and innovation domains and in distinguishing SMP from broader organizational outcomes. The synthetic PLS-SEM output demonstrates only that the proposed 21-indicator architecture and mediation workflow are analytically coherent. It provides no evidence that the relationships, coefficients, or implications characterize actual East Java SMEs.

The next required step is empirical validation using genuine field data. A future study should survey owners or senior managers from multiple districts and sectors, aim for at least 200 usable responses or a sample justified through power analysis, apply

proportional or stratified sampling where possible, complete expert and pilot validation, and report measurement, structural, predictive, nonresponse, and common-method assessments. Until such evidence is available, all managerial and policy implications should remain conditional propositions.

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