

Exploring the Mechanism of Enhancing Green M&A ESG Performance under Digital Transformation

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Abstract: Against the backdrop of accelerating digital transformation and growing global emphasis on sustainable development, green mergers and acquisitions (M&A) have emerged as a strategic pathway for enterprises to achieve dual goals of value creation and environmental responsibility. This paper systematically analyzes the challenges confronting green M&A in the digital era from three dimensions: information asymmetry in target screening, integration complexity in post-merger ESG alignment, and the cost-benefit imbalance in strategic planning. Drawing on ESG frameworks and digital governance theory, the paper examines how ESG concepts can be embedded across the full M&A lifecycle — encompassing due diligence, risk management, and performance evaluation — and proposes targeted suggestions for enhancing green M&A ESG outcomes through standardized disclosure frameworks, lifecycle ESG integration, digital risk monitoring, and governance institutionalization. The aim is to provide theoretical and practical reference for enterprises and policymakers seeking to advance sustainable M&A practices in a digitally empowered governance environment.

1. Introduction

With the continuous deepening of global economic integration and the growing urgency of sustainable development imperatives, enterprises increasingly face dual pressures: responding to tightening environmental and governance regulation, and demonstrating credible ESG commitments in their strategic activities. Against this backdrop, green mergers and acquisitions (M&A) — transactions oriented toward environmental objectives, resource efficiency, or sustainable value creation — have attracted considerable attention as a vehicle for achieving these goals simultaneously [1].

At the same time, digital transformation has fundamentally restructured the informational and operational foundations of corporate governance. Technologies including big data analytics, cloud computing, artificial intelligence, and blockchain have altered how firms collect, process, and disclose ESG-relevant data, manage cross-organizational risks, and execute post-merger integration strategies. Existing research confirms that digital transformation plays a significant positive moderating role in the relationship between ESG performance and corporate innovation outcomes,

and that enterprises with higher levels of digital governance maturity are better positioned to achieve transparency, particularly in ESG-related disclosures [2].

However, how digital transformation interacts with ESG performance in the specific context of green M&A remains an underexplored area. This paper therefore discusses the key challenges enterprises face in pursuing green M&A, examines how ESG concepts can be applied across different stages of the M&A process, and puts forward practical suggestions for improving ESG outcomes. The aim is to offer useful reference for enterprises and policymakers seeking to advance sustainable M&A practices in a digitally enabled environment.

2. Problems and Challenges

2.1. Information Asymmetry and ESG Data Gaps in Target Screening

A fundamental challenge in green M&A is the persistent information asymmetry between acquiring and target firms regarding ESG performance. Potential targets, particularly private enterprises or firms in less regulated jurisdictions, frequently lack standardized ESG disclosure mechanisms. Environmental liabilities, social compliance deficits, and governance irregularities may be concealed within conventional financial reporting systems, making reliable pre-acquisition ESG assessments difficult and costly.

Digital transformation has yet to fully close this gap. While data aggregation platforms and AI-assisted screening tools have improved the accessibility of ESG information, the absence of unified reporting standards — across frameworks such as GRI, SASB, and TCFD — creates inconsistencies that undermine cross-firm and cross-industry comparability [3]. For acquirers, this fragmentation increases due diligence costs and introduces significant uncertainty into ESG-adjusted valuation models. Enterprises with low levels of digital maturity, in particular, lack the information management systems needed to achieve high transparency in ESG disclosures, further compounding the informational challenges faced by potential counterparts in M&A transactions [4].

2.2. Integration Complexity in Post-Merger ESG Alignment

Even where ESG due diligence is conducted rigorously, post-merger integration presents distinct challenges for sustaining and improving ESG performance. Merging two organizations with divergent environmental management systems, labor practices, and governance cultures requires not only technical harmonization but also deep institutional reconfiguration. Legacy operational systems, entrenched organizational inertia, and misaligned incentive structures frequently impede the realization of anticipated ESG synergies.

Digital tools — including enterprise resource planning systems, environmental monitoring platforms, and compliance dashboards — provide critical infrastructure for post-merger ESG alignment. However, the integration of these platforms across merged entities involves substantial technical complexity, including reconciling incompatible data architectures, retraining personnel, and establishing new cross-departmental governance protocols [5]. Without a deliberate integration strategy anchored in ESG principles, digitalization may accelerate operational efficiency while leaving environmental and social performance goals inadequately addressed. Integrating data systems and bringing a newly acquired entity into compliance with the parent company's disclosure obligations can be resource-intensive, and without dedicated governance mechanisms these demands often exceed organizational capacity [6].

2.3. Cost-Benefit Imbalance in Green M&A Strategic Planning

Green M&A transactions typically involve elevated upfront costs relative to conventional acquisitions. Environmental remediation of acquired assets, upgrading pollution control infrastructure, restructuring supply chains to meet sustainability standards, and implementing green technology platforms all impose short-term financial burdens. Meanwhile, the benefits of green M&A — including enhanced brand reputation, preferential financing conditions, and long-term risk reduction — materialize over extended time horizons that traditional investment return models struggle to adequately capture.

This temporal mismatch creates a strategic planning dilemma for corporate decision-makers. When ESG investments in M&A cannot be readily quantified using conventional financial indicators, boards and investment committees may underallocate resources to green initiatives, prioritizing near-term financial metrics over long-term sustainability value. Traditional financial indicators are difficult to instantly reflect the value brought by green investment, and the contradiction between cost recovery period and investment return rate remains a primary constraint on corporate commitment to green M&A [7]. Digital transformation can help by improving ESG impact forecasting and enabling dynamic performance tracking, but only when ESG considerations are embedded systematically into the firm's strategic planning architecture from the outset.

3. The Application of ESG Concepts in Green M&A Operations

3.1. ESG-Driven Target Screening and Due Diligence

The integration of ESG frameworks into M&A target screening represents a fundamental shift in how acquirers define value and assess risk. Rather than evaluating targets solely on financial metrics, ESG-conscious acquirers apply environmental, social, and governance filters at the outset of target identification. Carbon intensity, resource efficiency ratios, labor rights compliance records, board diversity indicators, and anti-corruption mechanisms are increasingly treated as material factors in preliminary screening. ESG due diligence is now a vital component of evaluating the risks and opportunities linked to target companies, and sophisticated M&A practitioners treat ESG analysis as equally important as financial, operational, and legal review [8].

Digital transformation enables more rigorous and scalable ESG due diligence. Natural language processing tools can analyze unstructured disclosures to identify latent environmental liabilities or governance red flags. Blockchain-based verification platforms can authenticate supply chain sustainability claims. According to Deloitte's 2024 ESG in M&A Trends Survey, 57% of surveyed organizations now measure M&A impact on ESG profiles using defined and standardized metrics, up from 39% in 2022, and 91% expressed high or very high confidence in their ability to evaluate a target's ESG profile [9]. These trends reflect both the maturing of digital ESG assessment capabilities and the growing institutional expectation that ESG considerations will be embedded in M&A decision-making.

3.2. ESG and Enterprise Risk Management in M&A

ESG considerations play a critical role in post-merger risk management by expanding the scope of risks that merged entities must identify and mitigate. Beyond conventional financial and operational risks, green M&A integration must address environmental regulatory exposure, transition risks associated with decarbonization mandates, reputational risks stemming from social performance deficits, and governance risks arising from structural misalignment between merged entities. From the perspective of risk management practice, enterprises must integrate physical and

transformation risks caused by climate change, supply chain social risks, and governance process compliance risks into a unified management framework [6].

Modern enterprises are increasingly deploying integrated ESG risk management platforms that connect non-financial performance indicators — including environmental emission records, employee safety metrics, and compliance status — with enterprise-wide risk assessment systems. These platforms enable real-time monitoring of ESG risk exposures across consolidated business units, supporting dynamic risk response and regulatory reporting. In the context of green M&A, such platforms serve as essential instruments for ensuring that ESG commitments made during due diligence are operationally enforced following transaction closure and throughout the integration period.

3.3. ESG in Strategic Decision-Making and Performance Evaluation

The ESG concept is gradually permeating into the strategic decision-making level of enterprises, influencing capital allocation, market positioning, long-term investment return expectations, and organizational governance design. While evaluating traditional financial indicators, investors increasingly value how to assess a company's risk exposure and sustainability through ESG indicators, driving companies to consider ESG elements in their business models and value chains when formulating medium- and long-term strategies [##TMP_4##](#). In green M&A contexts specifically, ESG performance has been shown to influence acquisition premiums: research indicates that material ESG issues at both the firm and country level exert significant effects on bid premiums in cross-border M&A transactions [10].

Performance evaluation frameworks for green M&A must similarly evolve to reflect ESG dimensions. Comprehensive M&A performance metrics should incorporate environmental improvement indicators, social outcome measures, and governance improvement benchmarks alongside financial KPIs. Digital tools that aggregate and visualize these metrics in real time provide senior management and boards with the evidence base needed to assess whether green M&A transactions are delivering their intended sustainable value, and to make timely course corrections when ESG integration targets are not being met.

4. Suggestions for Enhancing Green M&A ESG Performance

4.1. Establish Unified ESG Standards and Digital Disclosure Frameworks

A foundational prerequisite for leveraging digital transformation in green M&A is the establishment of standardized ESG data frameworks applicable to M&A contexts. Regulatory authorities and industry bodies should collaborate to develop unified ESG disclosure requirements covering M&A-specific indicators, including pre-acquisition environmental liability assessments, integration-phase social performance benchmarks, and post-merger governance restructuring milestones. Standardized digital reporting interfaces would enable automated data aggregation, reduce due diligence costs, and improve the comparability of ESG performance across transactions.

Enterprises should proactively align their internal ESG data management systems with emerging international standards, including those issued by the International Sustainability Standards Board, to ensure their disclosures meet the expectations of investors, regulators, and counterparties in green M&A transactions. Investment in ESG data infrastructure — including centralized data governance platforms, automated ESG reporting tools, and third-party verification mechanisms — should be treated as a strategic priority rather than a compliance overhead. The continuous improvement and strict implementation of relevant laws and regulations will also prompt enterprises to raise their ESG standards progressively, forming a virtuous cycle between regulatory evolution and corporate

performance improvement [11].

4.2. Embed ESG Principles throughout the Full M&A Lifecycle

Enterprises pursuing green M&A should institutionalize ESG integration across all stages of the M&A lifecycle rather than treating ESG as a supplementary due diligence checklist. At the target screening stage, ESG filters should be applied systematically alongside financial criteria, with digital tools supporting automated ESG risk scoring and materiality assessments. During due diligence, dedicated ESG workstreams staffed by interdisciplinary teams — combining legal, environmental, social, and governance expertise — should assess target firms against quantitative performance benchmarks and regulatory compliance records.

Post-merger integration plans should include explicit ESG integration roadmaps with defined milestones, performance indicators, and clear accountability assignments. ESG due diligence moreover uncovers strategic opportunities — such as brand enhancement through sustainability leadership, cost savings via energy efficiency, or talent attraction through inclusive cultures — that can fuel post-merger value creation when systematically pursued [12]. Transaction agreements should increasingly contain ESG-specific representations, warranties, and indemnities addressing environmental compliance, labor standards, and governance practices, creating contractual accountability mechanisms that extend ESG commitments beyond deal closure.

4.3. Leverage Digital Platforms for Dynamic ESG Risk Monitoring

Enterprises should invest in integrated digital ESG risk management platforms that enable continuous monitoring of environmental, social, and governance risk exposures across consolidated M&A portfolios. These platforms should provide real-time dashboards aggregating key ESG performance indicators — including carbon emission trends, supply chain compliance rates, workforce safety records, and governance incident logs — and flagging emerging risks for management attention. By replacing periodic, retrospective ESG reporting with dynamic, forward-looking risk monitoring, enterprises can respond proactively to ESG performance deviations before they crystallize into material liabilities.

In the environmental dimension, enterprises should utilize big data, cloud computing, sensor networks, and other technologies to achieve precise monitoring of energy consumption, emission indicators, and resource recycling, providing foundational data support for accurate low-carbon strategy formulation in M&A integration [13]. Policy drivers such as carbon peak and carbon neutrality commitments create additional institutional impetus for enterprises to digitize their environmental governance, establishing a positive feedback loop between digital investment, regulatory compliance, and green M&A value creation. In constructing these platforms, enterprises should prioritize interoperability with external ESG data sources — including regulatory databases and third-party sustainability rating agencies — to ensure internal performance assessments are calibrated against external benchmarks.

4.4. Build Governance Structures that Institutionalize ESG Accountability

The realization of green M&A ESG performance improvements ultimately depends on governance structures that institutionalize ESG accountability at all organizational levels. Boards of merged entities should formally incorporate ESG performance metrics into executive compensation frameworks, creating direct incentive alignment between senior management and sustainable M&A outcomes. Compliance governance should prompt enterprises to establish and improve internal supervision mechanisms and perfect information disclosure systems, enhancing the transparency

and standardization of corporate governance in ways that align with ESG governance requirements [14]. The human resources department should incorporate ESG compliance performance into the performance evaluation system, distributing ESG responsibilities across functional units rather than concentrating them in isolated sustainability teams.

Regulatory authorities should reinforce internal governance reforms through legal and policy mechanisms. Tax incentives, financing preferences, and expedited regulatory approvals for enterprises demonstrating strong ESG performance in M&A activities can create positive external incentives. Conversely, enhanced enforcement of environmental and social compliance standards, combined with transparent public disclosure of M&A-related ESG performance records, can impose meaningful accountability for underperformance. The combined effect of strengthened internal governance and reinforced external oversight creates the institutional environment necessary for digital transformation to deliver sustained ESG performance improvements in green M&A.

5. Conclusions

This paper has examined the mechanisms through which digital transformation can enhance ESG performance in green M&A activities, identifying the principal challenges enterprises face, mapping ESG application across the M&A lifecycle, and proposing targeted suggestions spanning disclosure standardization, lifecycle ESG integration, digital risk monitoring, and governance institutionalization.

The analysis confirms that digital transformation and ESG principles are mutually reinforcing: digital tools provide the informational infrastructure needed to operationalize ESG commitments in complex M&A contexts, while ESG frameworks provide the strategic direction and institutional constraints that guide productive digital investment. Corporate compliance governance lays a solid foundation for ESG goal achievement, and the compliance culture it nurtures helps the ESG concept take root within enterprise operations; in turn, good ESG performance can enhance enterprise reputation, improve stakeholder relationships, reduce compliance risks, and drive the upgrading of compliance governance systems.

This research has certain limitations. The analysis is primarily conceptual and does not incorporate empirical validation across specific industry contexts. Future research should examine the relationship between digital governance maturity, ESG integration practices, and M&A performance outcomes across different enterprise types and regulatory environments, providing more precise guidance for enterprises navigating the complex intersection of digital transformation, ESG governance, and green M&A strategy.

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