

ESG AND ARTIFICIAL INTELLIGENCE INTEGRATION IN DIGITAL BANKING TRANSFORMATION: A QUALITATIVE CASE STUDY OF BANK RAKYAT INDONESIA

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ABSTRACT

Sustainability commitments and technological capabilities are increasingly expected to be integrated into a coherent strategic configuration rather than managed as parallel initiatives, particularly within digitally transforming financial institutions, yet limited evidence explains how this occurs in state-owned banks in emerging markets. This study examines how Bank Rakyat Indonesia (BRI), Indonesia's largest state-owned bank, appears to integrate Environmental, Social, and Governance (ESG) principles with Artificial Intelligence (AI) capabilities within its digital transformation strategy. Using a qualitative single case study design, the study analyses 47 secondary documents — annual reports, sustainability reports, and regulatory publications issued between 2021 and 2023 — through content and thematic analysis guided by the Resource-Based View, Dynamic Capabilities Theory, and Institutional Theory. Because the analysis relies entirely on corporate and regulatory disclosures, the findings are presented as interpretations of these public narratives rather than verified organizational facts. Four interconnected themes emerge: AI-driven data infrastructure strengthens ESG governance through monitoring and reporting; AI-assisted credit assessment for micro, small, and medium enterprises links ESG social objectives with AI implementation; BRI's proprietary AI ecosystem appears to generate competitive advantage through cumulative data assets and network effects; and ESG–AI narratives function as a legitimacy strategy toward regulators, investors, and development institutions. The study proposes the ESG–AI Strategic Convergence Model (EASCM), suggesting that competitive advantage may emerge when ESG and AI capabilities are co-designed as mutually reinforcing resources. The single-case, document-based design limits generalizability; future research should verify these propositions using primary data and cross-case comparison.

Keywords: ESG–AI Integration; Digital Banking Transformation; Financial Inclusion; Sustainable Competitive Advantage; State-Owned Banks

INTRODUCTION

The banking sector is increasingly shaped by the convergence of ESG commitments and AI-driven digital transformation. Integrating ESG principles with AI capabilities has become strategically important for improving governance, sustainability performance, and long-term competitive advantage. Banks that manage ESG and AI separately risk fragmented governance and inefficient strategic investment. Conversely, integrating both capabilities may strengthen operational efficiency, sustainability performance, and institutional legitimacy.

BRI represents a relevant case because of its strong MSME orientation, state-owned institutional mandate, and publicly documented ESG and AI transformation initiatives. Existing scholarship has, in the main, approached ESG and AI as distinct research domains. The ESG literature has concentrated on sustainability performance, stakeholder governance, and the risk management implications of non-financial disclosure. Research on AI in banking has largely emphasized technological efficiency, predictive analytics, and innovation-driven performance gains. While both bodies of work have generated important insights, their evolution in relative isolation has produced a significant conceptual gap: there is no established framework for understanding how ESG principles and AI capabilities interact as strategically complementary and co-evolving elements. This gap is sharpest in the context of state-owned banks in emerging markets, where the institutional conditions that shape both sustainability strategy and technological investment are markedly different from those that characterize private commercial banks in developed economies.

Three specific research gaps motivate the present study. First, although the strategic management literature has recognized that digital transformation fundamentally reshapes the resource and capability configurations through which banks compete, the possibility that ESG commitments might function as a constitutive design principle rather than an external constraint for AI system development has not been systematically explored (Ellström et al., 2022; Bhandari et al., 2022). Second, the institutional conditions specific to state-owned banks in emerging-market settings have been largely absent from ESG–AI research, despite the developmental significance and institutional distinctiveness of such institutions. Third, and most fundamentally, the literature reviewed for this study offers no integrative conceptual framework explaining how ESG and AI generate competitive advantages and institutional legitimacy in ways that neither capability achieves independently — a gap this study seeks to address through the ESG–AI Strategic Convergence Model (EASCM). BRI is selected because its scale, MSME mandate, and public ESG–AI disclosures make these dynamics unusually visible, though the single-case design means the empirical contribution lies primarily in the conceptual model proposed rather than in claims of generalizability across banks.

Although previous studies have separately examined ESG implementation and AI adoption in banking institutions, limited research has explored how both capabilities strategically converge within state-owned banks in emerging markets. Existing studies also rarely explain how ESG and AI integration contributes simultaneously to competitive advantage, institutional legitimacy, and digital financial inclusion. This study addresses that gap through the development of the ESG–AI Strategic Convergence Model (EASCM).

Three research questions organize the investigation:

1. How does BRI integrate ESG principles and AI capabilities within its digital transformation strategy?
2. What strategic mechanisms account for the relationship between ESG and AI integration at BRI?

3. What organizational and institutional factors support or constrain the implementation of ESG–AI convergence in a state-owned bank?

The article proceeds as follows. Section 2 reviews the relevant literature and develops the theoretical framework. Section 3 describes the research methodology. Section 4 presents and critically analyses the empirical findings, including the proposed EASCM. Section 5 draws conclusions, outlines theoretical contributions and practical implications, and identifies directions for future research.

LITERATURE REVIEW

Strategic Management and the Digital Transformation Challenge

This study adopts the Resource-Based View and Dynamic Capabilities Theory to explain how ESG and AI integration contributes to sustainable competitive advantage. Digital transformation is not simply technological modernization; it involves the fundamental reconfiguration of organizational processes, competitive logics, and business model architectures in ways that render established resource configurations inadequate and demand continuous renewal of capability. Dynamic Capabilities Theory Ellström et al. (2022) provides the most analytically precise framework for understanding how organizations navigate this condition. By distinguishing between the possession of ordinary operational capabilities and the higher-order capacity to sense emerging opportunities, seize them through organizational action, and reconfigure existing resource configurations accordingly, the framework draws attention to the organizational processes through which competitive positioning is actively constructed and reconstructed rather than merely inherited. In the banking context, where the challenge from financial technology entrants, the sophistication of regulatory requirements, and the expectations of increasingly digitally literate customers are all intensifying simultaneously, these higher-order sensing, seizing, and reconfiguring capabilities assume strategic significance.

Institutional Theory adds an explanatory dimension that neither the RBV nor Dynamic Capabilities frameworks fully capture. Gonzalez-Ruiz et al. (2024) foundational account of institutional isomorphism demonstrated that organizational behaviour is shaped not only by competitive pressures but by the normative expectations embedded in regulatory frameworks, industry standards, and stakeholder belief systems. Organizations adopt structures and practices that signal conformity to legitimate institutional models not exclusively or even primarily because such adoption maximizes economic efficiency, but because it generates the social authorization necessary for continued organizational functioning. For state-owned banks, this institutional dynamic operates with intensity: such institutions must simultaneously demonstrate commercial performance credibility and public development contribution, satisfying stakeholder audiences whose expectations may be in partial tension. This institutional complexity makes BRI a theoretically appropriate case for examining how strategic capability development including ESG–AI integration is shaped by and responsive to multiple, overlapping institutional logics.

ESG in Financial Institutions, Beyond Compliance Framing

Recent ESG research increasingly positions sustainability as a strategic organizational capability rather than merely a compliance requirement. ESG disclosure quality in banking is positively associated with reduced risk and enhanced market valuation but noted that this relationship is moderated by governance architecture: institutions with more sophisticated board oversight mechanisms extract more strategic value from ESG commitments than those

with weaker governance structures. This finding has important implications for the present study, as it suggests that the strategic value of ESG is not inherent in disclosure itself but emerges through the organizational capabilities and institutional structures through which sustainability commitments are operationalized. In the Indonesian banking context documented considerable heterogeneity in ESG adoption with some institutions pursuing genuine strategic integration while others maintain what amounts to a compliance theater, producing disclosures that satisfy regulatory requirements without generating meaningful organizational capability.

What remains largely unexplored in this literature is the relationship between ESG integration and technological capability development, particularly whether and how AI systems can serve as the operational infrastructure through which sustainability commitments are enacted, monitored, and continuously improved. Huang et al. (2023) touched on this possibility in examining the organizational conditions for ESG ladder-climbing but stopped short of theorizing the specific mechanisms through which technological and sustainability capabilities might co-evolve. It is precisely this gap that motivates the theoretical framework and empirical analysis developed in this article.

AI in Banking, Strategic Resource or Operational Instrument?

The rapid integration of AI into banking operations has prompted a parallel evolution in how technology is theorized within strategic management and financial services research. Early contributions were primarily operational in orientation, documenting improvements in credit risk assessment accuracy, fraud detection rates, and customer service efficiency (Mosteanu & Faccia, 2020). More recent work has adopted a more explicitly strategic frame, engaging with questions of how AI capabilities relate to competitive positioning, resource accumulation, and sustained performance advantage. AI capabilities supported by proprietary banking datasets can function as VRIN resources that generate sustainable competitive advantage.

Lanzolla et al. (2020) strengthens this argument by demonstrating that digital capabilities, including AI systems, tend to generate compounding rather than linear returns: accumulated data assets progressively improve model performance, widening the gap between early movers and followers over time. This path-dependency has critical strategic implications it suggests that the window for achieving durable AI-based competitive advantage is not indefinitely open, and that institutions that delay substantive AI investment risk finding themselves in positions of structural competitive disadvantage that become progressively harder to reverse. Despite these insights, the strategic AI literature in banking has engaged minimally with ESG dimensions, treating sustainability concerns as external constraints on AI deployment rather than as potential design principles that could shape AI capability in strategically distinctive and advantageous ways.

Financial Inclusion as the ESG–AI Strategic Nexus

Digital financial inclusion understood as the genuine availability of quality financial services to underserved populations through digital channels has emerged as one of the most analytically productive domains for examining the intersection of ESG social objectives and AI capability development. In markets like Indonesia, where substantial segments of the population and the MSME sector have historically been excluded from formal financial systems, the expansion of digital financial access constitutes both a developmental priority and a commercially significant market opportunity. The structural conditions that make this population financially underserved, limited formal credit history, geographic distance from branch networks, income variability are precisely the conditions for which AI-driven

alternative credit assessment offers the most distinctive advantages over conventional underwriting approaches.

This convergence is strategically significant for reasons that go beyond the obvious commercial logic. When AI capabilities are deliberately oriented toward financial inclusion objectives rather than optimized primarily for efficiency or risk minimization the resulting systems accumulate proprietary data assets that reflect the specific characteristics of underserved markets. These data assets are not merely commercially valuable; they generate institutional relationships, trust networks, and community presence that constitute additional layers of competitive moat reinforcing the technical advantages of the AI system itself. The ethical alignment of AI deployment with ESG social goals also generates a form of institutional legitimacy with regulators and development finance institutions that translates into concrete financial benefits, access to sustainability-linked capital at preferential pricing, regulatory goodwill, and strategic positioning as a responsible financial inclusion champion.

Demirgüç-Kunt et al. (2022) and Sustainable Banking and Finance Network (2024) have documented the macroeconomic significance of digital financial inclusion in developing economies but have not theorized the specific mechanisms through which inclusion-oriented AI deployment generates ESG-aligned competitive advantage at the firm level. Bridging this gap requires a conceptual framework that explicitly accounts for the feedback dynamics between AI capability development and ESG value creation a framework that the EASCM, developed in Section 4.5, is intended to provide.

Theoretical Framework

This study adopts an integrated multi-lens theoretical framework combining three complementary perspectives the Resource-Based View (Bhandari et al., 2022), Dynamic Capabilities Theory (Ellström et al., 2022), and Institutional Theory (Gonzalez-Ruiz et al., 2024; Santoso et al., 2026) selected because the ESG–AI integration phenomenon it examines operates simultaneously at the levels of resource configuration, organizational process, and institutional context. No single framework captures all three levels with adequate precision.

The Resource-Based View provides the foundational logic for evaluating whether ESG-related practices and AI capabilities constitute genuine sources of sustainable competitive advantage. Its VRIN criteria offer a systematic basis for distinguishing between capabilities that generate durable strategic value and those that represent operational necessities offering no distinctive advantage. Dynamic Capabilities Theory extends this foundation by directing attention toward the organizational processes through which resource configurations are actively constructed and reconstructed over time particularly relevant for understanding how banks translate sensing of sustainability demands and technological opportunities into institutionalized operational capabilities. Institutional Theory completes the framework by situating organizational strategy within the normative and regulative environment that shapes which strategic choices are perceived as legitimate, feasible, and desirable. For a state-owned bank navigating developmental and commercial mandates simultaneously, this institutional dimension is not peripheral but constitutive it shapes the strategic options that management can credibly pursue and the stakeholder audiences whose legitimation is organizationally consequential.

RESEARCH METHOD

Research Design and Philosophical Orientation

This study adopts a qualitative research design grounded in an interpretive epistemological orientation. The choice of qualitative methodology reflects the nature of the research questions, which are concerned not with measuring the frequency or magnitude of ESG–AI integration outcomes but with understanding the strategic processes, institutional mechanisms, and organizational logics through which integration occurs. These are inherently meaning-laden phenomena that resist adequate quantification: the question of why BRI chose to co-design its AI systems around financial inclusion objectives, rather than pursuing efficiency optimization alone, cannot be answered by measuring correlations between variables but requires interpretive engagement with the strategic reasoning and institutional pressures that shaped this choice.

A single case study research strategy is employed, following the methodological principles established by Hunziker and Blankenagel (2021). The case study design is particularly appropriate for this investigation because ESG–AI integration at BRI cannot be meaningfully analysed in isolation from the bank's organizational history, state-ownership mandate, regulatory environment, and evolving strategic trajectory contextual conditions that constitute the phenomenon rather than representing noise around it. Within the qualitative research tradition, the single case study enables the depth of contextual engagement and interpretive precision that the research questions demand, while the selection of BRI on theoretically motivated grounds ensures that the case contributes to analytical generalization the extension and refinement of theoretical propositions rather than statistical generalization (Hunziker & Blankenagel, 2021).

Case Selection and Justification

BRI was selected as the focal case based on four theoretically motivated criteria. First, its status as Indonesia's largest state-owned commercial bank, operating within a complex institutional environment that combines commercial profitability requirements with explicit public development mandates, makes it a paradigmatic instance of the institutional conditions most relevant to the research questions. The bank's dual mandate serving shareholders while advancing national financial inclusion objectives generates precisely the institutional tensions through which the strategic logic of ESG–AI integration is most fully expressed and most analytically visible.

Second, BRI has demonstrated sustained, publicly documented commitment to both ESG principles and AI-based digital transformation throughout the study period. Its comprehensive sustainability reporting against GRI Standards and TCFD recommendations, its coverage by major international ESG rating agencies including MSCI, Sustainalytics, and S&P Global, and its published disclosures regarding AI investment and deployment provide a rich documentary corpus that enables rigorous analysis without dependence on restricted internal sources. Third, BRI's focus on MSME lending and rural financial access creates a strategic context in which the alignment between ESG social objectives and AI capability development is not merely rhetorical but operationally constitutive the bank's AI systems are literally designed around the financial inclusion challenge that defines its ESG social commitments. Fourth, the availability of institutionally audited, publicly accessible documentary evidence across multiple reporting periods ensures that analytical conclusions can be grounded in verifiable sources and subjected to independent scrutiny.

Data Sources and Collection

Documentary data were collected from multiple institutionally distinct source categories spanning 2021 to 2023. Primary institutional sources included BRI Annual Reports (2021, 2022, 2023), BRI Sustainability Reports (2021, 2022, 2023), and official regulatory documents from the Financial Services Authority (OJK) and Bank Indonesia. Supplementary institutional assessments comprised ESG rating reports and score summaries from MSCI, Sustainalytics, and Bloomberg Intelligence. Academic literature in strategic management, digital banking, and sustainability provided theoretical and interpretive scaffolding for analysis.

Source selection followed a structured eligibility procedure based on direct relevance to ESG commitments, AI deployment strategies, digital transformation objectives, and regulatory compliance dimensions of BRI's organizational strategy. Only publicly verified and institutionally audited documents were incorporated into the analytical corpus, a criterion that serves both epistemological and ethical functions, ensuring that the data foundation is simultaneously credible and replicable. In total, 47 primary documents were included in the analytical corpus. This multi-source design strengthens analytical rigor through data triangulation, consistent with the methodological principles (Hunziker and Blankenagel, 2021).

To improve analytical transparency, the study employed a multi-stage coding process consisting of open coding, axial coding, and selective coding. Initial codes were generated from recurring strategic narratives identified across annual reports, sustainability disclosures, and regulatory documents. These codes were subsequently grouped into broader analytical categories and synthesized into higher-order strategic themes aligned with the study's theoretical framework.

Table 1. Illustrative Coding Framework and Theme Development

Initial Code	Category	Strategic Theme	Representative Evidence Source
AI-based credit scoring	Financial inclusion mechanism	ESG–AI convergence in MSME financing	BRI Sustainability Report (2023)
Digital lending platform	Inclusive banking access	ESG–AI convergence in MSME financing	BRI Annual Report (2022)
Automated ESG monitoring	Governance digitalization	AI-enabled ESG governance	Sustainability Disclosure (2023)
Real-time compliance analytics	Risk and governance control	AI-enabled ESG governance	OJK Digital Banking Framework
Proprietary AI ecosystem	Strategic digital capability	Sustainable competitive advantage	BRI Integrated Report (2023)
Data accumulation capability	Platform network effects	Sustainable competitive advantage	Annual Report (2021–2023)
ESG communication strategy	Institutional legitimacy	Legitimacy and stakeholder alignment	Sustainability Report (2022)
Regulatory ESG alignment	Institutional adaptation	Legitimacy and stakeholder alignment	OJK ESG Banking Roadmap

The coding process enabled the identification of recurring strategic patterns linking ESG initiatives and AI deployment within BRI's digital transformation agenda. The resulting thematic structure also strengthened analytical consistency by connecting empirical observations with the Resource-Based View, Dynamic Capabilities Theory, and Institutional Theory.

Data Analysis, Coding Process and Thematic Development

Analysis followed a two-stage sequential procedure combining content analysis and thematic analysis selected because the combination captures both the explicit salience of ESG–

AI references across documentary sources and the deeper strategic meanings and patterns underlying those references (Braun & Clarke, 2019).

The coding process proceeded through three analytically distinct stages. Open coding involved close, repeated reading of all documents without predetermined categories, generating an initial list of approximately 180 conceptual codes capturing specific references to AI deployment, ESG commitments, governance mechanisms, competitive positioning, institutional relationships, and regulatory responses. At this stage, codes were kept deliberately descriptive and close to the documentary language for example, AI credit scoring for MSME, ESG real-time monitoring, OJK regulatory compliance narrative, and sustainability bond pricing advantage.

Axial coding involved systematic examination of relationships among open codes, reorganizing them around core categorical dimensions that captured the structural logic connecting individual observations. This stage generated eight intermediate categories, AI infrastructure development, ESG governance integration, financial inclusion strategy, competitive resource accumulation, legitimacy management, regulatory compliance, stakeholder narrative calibration, and institutional positioning. These categories were not derived deductively from the theoretical framework but emerged inductively from the data before being interpreted considering the theoretical perspectives.

Selective coding brought the intermediate categories into systematic relationship with one another and with the study's theoretical frameworks, identifying four overarching strategic themes corresponding to the four themes presented in the findings section as the central organizing constructs of the analytical narrative. The selective coding stage involved iterative cross-validation of theme coherence across the full document corpus, ensuring that each theme was robustly supported by evidence from multiple source types and multiple reporting years rather than isolated in a single document or period. An audit trail documenting the movement from individual coded passages to intermediate categories and final themes was maintained throughout the analysis, enabling independent verification of the interpretive process.

Thematic Analysis Stages and Trustworthiness

Thematic analysis followed the six-phase protocol established by Braun and Clarke (2006). Familiarization involved immersive, repeated engagement with the full documentary corpus to develop deep contextual understanding before coding commenced. Systematic initial code generation then produced the open code inventory described above. Collation of codes into candidate themes involved grouping related codes into thematic clusters and identifying the relational logic that gave each cluster coherence as a strategic theme. Recursive review and refinement of themes against the full dataset ensured that no significant counterevidence had been overlooked and that theme boundaries were appropriately defined neither too narrow to capture the full range of relevant evidence nor too broad to retain analytical precision. Definition and naming of final themes involved articulating the core claim of each theme in language that was both analytically precise and theoretically connected. Production of the analytical narrative translated the thematic structure into the critical interpretive discussion presented in Section 4.

Trustworthiness was established through four criteria adapted from Lincoln and Guba's framework for qualitative rigor. Credibility was achieved through data triangulation across annual reports, sustainability disclosures, regulatory documents, and third-party ESG assessments with triangulation specifically designed to test whether themes identified in corporate disclosures were corroborated or contested by independent institutional sources. Transferability was addressed through the provision of thick contextual description, enabling

readers to assess the applicability of findings to other institutional settings rather than claiming universal generalizability. Dependability was ensured through the documented audit trail linking all analytical interpretations to specific documentary sources. Confirmability was maintained through an explicit coding framework, summarized in Table 2, that renders the analytical process transparent and open to independent review.

Table 2. Research Framework Summary

Component	Description	Theoretical Basis	Coding Stage	Data Source
Research Design	Qualitative single case study, interpretive epistemology	Hunziker and Blankenagel (2021)	N/A	N/A
Case	Bank Rakyat Indonesia (BRI), 2021–2023	Purposive case selection	Open coding (contextual familiarization)	BRI Annual & Sustainability Reports
Open Coding	~180 descriptive codes from documentary corpus	Braun and Clarke (2019)	Familiarization, initial code generation	47 primary documents
Axial Coding	8 intermediate categories relating codes	Grounded theory principles	Code collation, candidate theme development	All source types
Selective Coding	4 strategic themes, theoretical integration	RBV, Dynamic Capabilities, Institutional Theory	Theme review, definition, analytical narrative	Triangulated across all sources
Trustworthiness	Credibility, transferability, dependability, confirmability	Adler (2022)	Audit trail, triangulation, thick description	All source types
Outcome	ESG–AI Strategic Convergence Model (EASCM)	Original theoretical contribution	Integrated thematic synthesis	All sources combined

RESULTH AND DISCUSSION

Analysis of the 47-document corpus through the three-stage coding process yielded four interlocking strategic themes constituting BRI's ESG–AI integration architecture. Crucially, these themes are not analytically independent, they form a mutually constitutive strategic configuration in which each theme both enables and depends upon the others. Table 3 provides a structured thematic overview before each theme is developed in detail.

Table 3. Thematic Overview of ESG–AI Integration at BRI

Theme	Core Strategic Mechanism	ESG–AI Linkage	Theoretical Anchoring	Key BRI Evidence
T1, Governance Innovation	AI-enabled ESG measurement and automated reporting	AI provides G-dimension precision, ESG mandates AI governance standards	Dynamic Capabilities, Institutional Theory	BDAC, IDR 3.2 trillion AI investment (2023)

Theme	Core Strategic Mechanism	ESG–AI Linkage	Theoretical Anchoring	Key BRI Evidence
T2, Inclusive Growth Engine	AI-powered alternative credit scoring extending MSME access	BRISPOT instantiates Social ESG objective	RBV (VRIN), Financial Inclusion Literature	32.4 million MSME borrowers, NPL 2.8% (2023)
T3, Competitive Moat Construction	Proprietary AI ecosystems as VRIN resources, ESG reputational moat	Data assets + ESG reputation create compound advantage	Resource-Based View (Lanzolla et al., 2020)	MSME loan CAGR 9.1% vs. sector 6.3% (2021–2023)
T4: Legitimacy Architecture	Calibrated ESG–AI narrative for multiple institutional audiences	Responsible AI framing enhances ESG credibility with rating agencies	Institutional Theory (Santoso et al., 2026)	Green Bond USD 500M (2021), Sustainability Bond USD 750M (2022)

Theme 1, AI-Enabled ESG Measurement as Governance Innovation

A foundational observation emerging from the documentary analysis is that BRI's deployment of AI-powered data analytics extends significantly beyond operational efficiency applications to function as the technical backbone of its ESG governance architecture. The establishment of the BRI Data Analytics Centre (BDAC), documented in BRI's Sustainability Report (2023), represents an organizational investment in institutional capacity for ESG measurement, verification, and real-time reporting across a network of more than 10,500 branches. This configuration is qualitatively distinct from the compliance-oriented ESG reporting that identified as characteristic of many Indonesian banking institutions: rather than assembling retrospective disclosures from decentralized data silos, BRI has invested in AI infrastructure that enables continuous, institution-wide ESG monitoring.

Interpreted through the Dynamic Capabilities framework, this governance innovation constitutes a seizing capability the organizational capacity to translate awareness of regulatory and market ESG demands into concrete institutional mechanisms that generate durable strategic value. The BDAC's ability to integrate environmental, social, and governance data streams across a geographically dispersed branch network enables managerial decision-making at a level of granularity that was structurally unavailable in pre-digital reporting environments. Moreover, the progressive improvement of AI diagnostic accuracy as the system processes increasing volumes of ESG-relevant data creates a capability trajectory characterized by organizational learning and deepening precision rather than static efficiency a dynamic consistent with Ellström et al. (2022) argument that genuinely strategic capabilities improve through use.

Despite improving ESG governance efficiency, AI-enabled monitoring systems also introduce risks related to algorithmic accountability, data reliability, and governance oversight. The reciprocal dynamic wherein ESG governance requirements drive AI investment, which in turn enhances ESG measurement quality, which strengthens ESG ratings and sustainability capital market access constitutes the Governance Integration dimension of the EASCM proposed in Section 4.5. This finding extends Dynamic Capabilities Theory by demonstrating that AI-enabled ESG governance can function as a seizing mechanism through which regulatory sustainability demands are transformed into evolving operational systems generating strategic value that compounds over time.

Theme 2, Digital Financial Inclusion as the ESG–AI Strategic Nexus

Among all the domains in which ESG and AI converge within BRI's strategic architecture, digital financial inclusion is the most empirically prominent, organizationally distinctive, and theoretically most significant. The BRISPOT credit assessment engine represents the operational heart of this convergence: employing machine learning algorithms trained on BRI's extensive microfinance transaction database accumulated over more than 128 years of relationship banking with Indonesian MSME clients BRISPOT generates credit recommendations within minutes for loan applicants with limited formal credit history, replacing a multi-day manual underwriting process that effectively excluded large segments of the MSME population from formal credit access. By the end of 2023, BRISPOT had facilitated loan disbursements to over 32.4 million MSME borrowers, with a non-performing loan ratio of 2.8% significantly below the Indonesian banking sector average (BRI Sustainability Report, 2023).

BRISPOT demonstrates how proprietary MSME transaction datasets can create sustainable competitive advantage through AI-driven credit assessment capabilities. The BRImo digital banking platform complements BRISPOT's credit function, reporting 38.7 million registered users as of December 2023 a compound annual growth rate of approximately 88% from 10.9 million users in 2021 (BRI Annual Report, 2023). The behavioral data generated through BRImo's AI-enabled features including personalized product recommendations and the SAPA BRI conversational interface feeds back into BRISPOT's credit models, creating an integrated ecosystem in which inclusion-oriented AI deployment generates data assets that deepen the very AI capabilities driving inclusion. This feedback dynamic is central to the competitive advantage argument.

It is important, however, to avoid an uncritically celebratory reading of these findings. Several analytical concerns deserve acknowledgment. First, the assumption that algorithmic credit assessment is inherently inclusion-promoting requires scrutiny: AI systems trained on historical lending data may systematically underestimate creditworthiness for demographic groups that were excluded from formal credit in the training period, perpetuating historical exclusion under a technological veneer of objectivity. BRI's sustainability disclosures reference algorithmic fairness audits but do not provide sufficient detail to assess whether these audits employ best-practice methodologies or constitute primarily compliance theatre. Second, the NPL ratio of 2.8%, while below sector average, masks distributional variation across borrower segments and geographic regions that aggregate figures cannot capture. Third, the dependency of 32.4 million MSME borrowers on AI-mediated credit assessment creates systemic risk model failure, data breaches, or regulatory interventions could simultaneously affect access to credit for millions of economically vulnerable borrowers. These risks are not merely operational, they represent ESG governance vulnerabilities that the existing analytical framework does not fully address.

Theme 3, Sustainable Competitive Advantage Through Proprietary AI Ecosystems

Analysis of BRI's strategic communications and investment disclosures across 2021 to 2023 reveals a deliberate strategy of constructing an interlocking proprietary AI ecosystem designed to generate competitive advantages that compound over time. The ecosystem encompassing BRISPOT for credit assessment, SAPA BRI for customer service automation, BRImo for digital banking, BRIAPI for open banking infrastructure, and BDAC for analytics governance is architected as a mutually reinforcing system: each component generates data and insights that improve the performance of the others, while the integrated whole creates network

effects and switching costs that are structurally unavailable to competitors lacking comparable ecosystem breadth and depth.

BRI's integrated AI ecosystem creates data-driven network effects that strengthen long-term competitive positioning and financial inclusion capabilities. The competitive advantage generated through this strategy is most directly evidenced in MSME market share dynamics: BRI's MSME loan portfolio grew from IDR 587.6 trillion in 2021 to IDR 698.9 trillion in 2023, a compound annual growth rate of 9.1% materially outpacing the Indonesian banking sector's overall MSME credit growth rate of 6.3% over the same period (BRI Annual Report, 2023). This outperformance is consistent with the compounding digital advantage argument advanced by Lanzolla et al. (2020), each new MSME borrower onboarded through BRISPOT generates additional training data, improves model performance, potentially deepens the borrower relationship through BRI'mo, and contributes to the data assets that sustain competitive moat over time.

A critical perspective, however, requires acknowledging that the scalability of this model is not unlimited. BRI's competitive advantage in MSME AI is structurally dependent on sustained investment in AI infrastructure, human capital with the technical capacity to maintain and improve complex ML systems, and organizational governance frameworks capable of managing the ethical and operational risks that accompany large-scale AI-mediated lending. As digital-native challengers fintech lenders with potentially more agile development cycles and less legacy infrastructure enter the MSME credit market with increasing sophistication, BRI's data advantage may narrow over time, particularly for urban MSME segments where alternative data sources and digital financial footprints are more abundant. The long-term sustainability of the competitive moat depends on continued ecosystem investment and innovation rather than on any static advantage.

Theme 4, Institutional Legitimacy Architecture Through ESG–AI Narrative Alignment

The fourth strategic theme concerns the deliberate construction of an integrated ESG–AI narrative calibrated to address the distinct legitimacy expectations of multiple institutional audiences simultaneously. Documentary analysis reveals a sophisticated stakeholder-differentiated communication strategy that merits both analytical recognition and critical interrogation.

For international institutional investors and ESG rating agencies including MSCI, Sustainalytics, and S&P Global BRI's narrative foregrounds responsible AI governance frameworks, algorithmic fairness audit mechanisms, explainability standards for credit decisions, and data privacy protection architecture. This narrative positioning addresses a recognized concern among ESG-oriented investors, that AI deployment may introduce governance and reputational risks that offset or undermine sustainability performance gains (Floridi et al., 2020). By explicitly framing AI governance as an integral component of ESG governance rather than a separate technology risk domain BRI positions its AI investment as ESG-value-additive rather than ESG-risk-generating.

For domestic regulatory audiences including OJK, Bank Indonesia, and the Ministry of State-Owned Enterprises the narrative foregrounds national development alignment, positioning AI as an enabler of financial inclusion, digital literacy, and rural economic empowerment consistent with Visi Indonesia Digital 2045 and OJK's Financial Inclusion Roadmap (Otoritas Jasa Keuangan, 2021). This alignment serves coercive legitimacy functions, reducing regulatory friction and reinforcing BRI's strategic position as an indispensable partner in Indonesia's digital development agenda. For development finance partners including the Sustainable Banking and Finance Network, ADB, and bilateral development institutions BRI's

narrative emphasizes climate finance mechanisms and social impact measurement capabilities enabled by its AI analytics infrastructure, enabling access to concessional funding and sustainability-linked capital at preferential pricing. This legitimacy strategy contributed to successful sustainability bond issuance and lower financing costs while also increasing the importance of transparent ESG and AI governance.

The ESG–AI Strategic Convergence Model (EASCM)

Synthesizing the four thematic findings, this study introduces the ESG–AI Strategic Convergence Model (EASCM) as its primary theoretical contribution. The model represents a departure from both conventional RBV analyses which treat capabilities as relatively stable resource stocks and conventional Institutional Theory accounts which treat legitimacy as a condition to be maintained rather than actively constructed through capability investment. The EASCM posits that sustainable competitive advantage in digitally transforming financial institutions arises specifically when ESG commitments and AI capabilities are co-designed as mutually reinforcing elements, such that each reinforces the strategic value and institutional credibility of the other across four mutually constitutive dimensions.

The Governance Integration dimension recognizes that AI infrastructure serves as the technical backbone for ESG measurement and verification, while ESG governance frameworks provide the ethical accountability architecture within which AI development and deployment operate. This reciprocal relationship ensures that AI investment strengthens ESG quality, and ESG standards constrain AI risk exposure creating a governance dynamic that is simultaneously performance-enhancing and risk-mitigating. The Value Creation Alignment dimension reflects the deliberate orientation of AI capabilities toward ESG social and environmental objectives, generating measurable societal outcomes while simultaneously producing the VRIN resources particularly proprietary data assets that accumulate through inclusion-oriented deployment that sustain competitive advantage. The Competitive Moat Construction dimension describes how the combination of AI data ecosystems and ESG-based reputational capital creates compound, path-dependent advantages that neither ESG commitments nor AI capabilities generate independently. The Legitimacy Amplification dimension captures how integrated ESG–AI strategies generate mutually reinforcing legitimacy signals across regulatory, investor, and civil society audiences, reducing financing costs and regulatory friction in ways that sustain the organization's institutional position.

EASCM makes a distinctive contribution relative to existing frameworks in three respects. Unlike the digital transformation framework articulated by Lanzolla et al. (2020), which treats AI as a standalone capability generating compounding returns, the EASCM explicitly incorporates ESG commitments as constitutive design principles that shape the strategic direction and social legitimacy of AI deployment. Unlike the ESG capability framework developed in the sustainability, which focuses on ESG as a governance and risk management resource, the EASCM introduces AI as the technical mechanism through which ESG capabilities are enacted on institutional scale. Unlike traditional RBV perspectives, which evaluate capabilities against static VRIN criteria, the EASCM introduces a dynamic mechanism: ESG-AI co-design generates capabilities whose VRIN characteristics strengthen over time through compounding data accumulation, deepening organizational learning, and progressive legitimacy consolidation.

Table 4. EASCM Dimensional Analysis: ESG and AI Roles with BRI Evidence

EASCM Dimension	ESG Role	AI Role	BRI Empirical Evidence	Critical Risks
Governance Integration	Mandates accountability standards and ethical boundaries for AI	Enables real-time ESG measurement and automated reporting	BDAC across 10,500+ branches, IDR 3.2T AI investment (2023)	Algorithmic governance risk, AI measurement bias
Value Creation Alignment	Directs AI toward social and environmental objectives	Alternative credit scoring enables access for unbanked populations	BRISPOT, 32.4M MSME borrowers, NPL 2.8% (2023)	Algorithmic bias, systemic inclusion risk
Competitive Moat Construction	ESG reputation creates reputational moat and sustainability financing access	Proprietary AI ecosystems generate compounding data advantages	MSME CAGR 9.1% vs. sector 6.3% (2021–2023)	Fintech competition, scalability limitations
Legitimacy Amplification	ESG narrative reduces regulatory friction, strengthens investor confidence	Responsible AI framing enhances ESG credibility with rating agencies	Green Bond USD 500M (2021), Sustainability Bond USD 750M (2022), 15–25 bps saving	Greenwashing scrutiny, narrative credibility risk

Comparative Analysis and Structural Limitations

To contextualize the EASCM findings, Table 5 presents a comparative analysis of ESG–AI integration approaches across BRI and three globally prominent banking institutions: JPMorgan Chase, HSBC, and DBS Bank. The comparison is not intended as a performance ranking but as a structural analysis of the institutional conditions and strategic choices that shape distinct ESG–AI integration trajectories. The comparison draws on each institution’s own published disclosures rather than a common, independently verified dataset, and the resulting classifications (e.g., “high,” “moderate”) are the authors’ qualitative judgments rather than scores derived from a standardized instrument; it is offered as an illustrative positioning exercise rather than a systematic comparative methodology, and should be read accordingly.

Table 5. Comparative Analysis of ESG–AI Integration, BRI and Selected Global Banks

Dimension	BRI	JPMorgan Chase	HSBC	DBS Bank
Strategic Orientation	Inclusion-driven sustainability	Profit and risk optimization	Sustainability-led strategy	Digital-first banking
Primary ESG Focus	Social inclusion (MSME)	Governance and risk transparency	Environmental sustainability	Balanced ESG approach
AI Deployment	Credit scoring; inclusion analytics	Risk analytics; fraud detection	ESG analytics; compliance	Customer experience; automation
ESG–AI Integration Level	High — deeply co-designed	Moderate — parallel approach	Moderate-High — integration emerging	High — platform-based integration
Primary Data Advantage	MSME proprietary dataset (128 years)	Global financial transaction data	ESG and compliance dataset	Digital ecosystem behavioral data
Key Strategic Limitation	Scalability, algorithmic bias risk	ESG not fully embedded in AI design	Slower digital transformation pace	Limited rural inclusion focus

The comparative evidence suggests that the ESG–AI co-design approach distinctive to BRI and, to a lesser extent, DBS represents one end of a strategic spectrum, with most global banking institutions maintaining ESG and AI as strategically parallel rather than genuinely integrated programs. JPMorgan Chase's AI capabilities are oriented primarily toward risk management and efficiency optimization, with ESG maintained as a compliance and stakeholder reporting function. HSBC shows stronger ESG-AI alignment in the environmental dimension, particularly in climate risk analytics, but its AI deployment does not extend to the kind of inclusion-oriented credit assessment that constitutes the core of BRI's integration logic. DBS represents the closest global analogy to BRI's platform-based integration approach, but with a markedly different social orientation focused on urban digital consumers in developed and developing Asian markets rather than rural MSME populations.

These comparisons strengthen the argument that BRI's ESG–AI convergence is not simply a function of favourable institutional conditions but reflects deliberate strategic choices about the design principles governing AI development choices that are analytically replicable in other emerging-market banking contexts sharing comparable institutional features, even if the specific product configurations and market positions would differ substantially.

CONCLUSION

This article has examined the strategic integration of ESG principles and AI capabilities within BRI's digital transformation strategy over the 2021–2023 period, developing four interrelated analytical themes through a qualitative single case study design informed by three complementary theoretical frameworks. Returning to the three research questions: BRI appears to integrate ESG and AI primarily through AI-enabled ESG governance, AI-assisted MSME credit assessment, a proprietary data ecosystem, and legitimacy-oriented narrative alignment (RQ1); the strategic mechanism connecting the two is co-design rather than parallel management, with each domain shaping the other's development (RQ2); and this co-design appears to be supported by BRI's scale and state mandate, while remaining constrained by data-quality, algorithmic-bias, and disclosure-verification limitations (RQ3). Read as interpretations of BRI's public disclosures rather than as verified organizational facts, the evidence is consistent with the proposition that when ESG and AI are co-designed as mutually reinforcing strategic capabilities rather than managed as independent programs, the resulting configuration is associated with competitive advantages, institutional legitimacy, and governance quality that neither capability appears to produce independently.

THEORETICAL CONTRIBUTIONS

Three principal contributions to strategic management and sustainability literature emerge from this study. The ESG–AI Strategic Convergence Model constitutes the most substantial theoretical contribution, offering a conceptual framework that articulates the mechanisms through which ESG and AI generate mutually reinforcing strategic value across governance, value creation, competitive positioning, and legitimacy dimensions. Unlike existing digital transformation frameworks, which treat sustainability as peripheral, or ESG capability frameworks, which are technologically underspecified, the EASCM integrates both domains into a coherent causal architecture with testable theoretical implications.

The study also advances Dynamic Capabilities Theory by demonstrating that ESG–AI co-design constitutes a form of higher-order capability one that enables organizations to sense sustainability-related opportunities, seize them through AI-enabled governance and inclusion

mechanisms, and reconfigure their institutional positioning accordingly. Finally, the study enriches Institutional Theory by illustrating that legitimacy is not merely maintained through conformity to institutional expectations but is actively constructed through capability investment particularly in contexts where ESG and AI claims can be made mutually credible through their operational interdependence.

PRACTICAL IMPLICATIONS

For banking executives, the findings suggest that ESG–AI integration should be treated as a strategic design challenge rather than a governance overlay. Achieving genuine integration requires not merely the deployment of AI for ESG reporting purposes or the adoption of ESG metrics as AI evaluation criteria, but the deliberate co-design of AI system architectures around ESG social objectives from the earliest stages of capability development. These demands coordinated governance across sustainability, technology, and risk management functions, along with investment in the unified data infrastructure that makes real-time ESG monitoring technically feasible.

For policymakers and regulators, the BRI evidence suggests that regulatory frameworks can function as catalysts for capability co-design when they require not merely ESG disclosure but evidence of the operational mechanisms through which sustainability objectives are enacted. OJK's Sustainable Finance Roadmap, in combination with its AI governance guidelines, creates precisely this incentive structure. Development finance institutions may similarly find that BRI's inclusion-driven ESG–AI model offers a viable template for scaling responsible digital finance in comparable emerging-market contexts, provided that algorithmic accountability and institutional governance quality can be independently verified.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Several methodological limitations circumscribe the findings. Reliance on a single case design, while appropriate for the exploratory objectives and the analytical depth these require, limits direct generalizability; the analytical framework developed here must be tested across diverse institutional contexts before its broader applicability can be established. The secondary documentary data design restricts access to informal organizational processes, internal deliberations, and implementation conflicts that primary qualitative methods would capture more fully. The study period covers only three years, which may be insufficient to fully capture the path-dependent dynamics that are theoretically central to the EASCM's competitive advantage arguments.

Future research might address these limitations through comparative multi-case studies across private commercial banks, digital-native challengers, and foreign banking institutions in Indonesia and comparable emerging markets, enabling systematic testing of the EASCM propositions across varied institutional contexts. Mixed-method designs incorporating primary interview data with senior strategy, technology, and sustainability executives would provide richer access to the decision-making logic underlying ESG–AI integration choices. Longitudinal research designs extending beyond the three-year window examined here would be particularly valuable for assessing whether the compounding advantage dynamics posited in the EASCM are empirically sustained or whether they are subject to competitive erosion. Quantitative studies examining the relationship between ESG–AI integration intensity and financial performance outcomes would complement this study's qualitative, mechanism-focused contribution.

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