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Data Infrastructure as a Catalyst for Effective Corporate Governance in Agile Boards

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As digital advancements change the way we govern corporations, corporate boards must embrace a new model of governance, one that takes an agile and data-driven approach to their decision-making. To succeed in this new environment, boards will need to rely on a solid data infrastructure (i.e., real-time analytics, digital dashboards and integrated reporting systems) that provides transparency and accountability throughout the governance process and a strategic overview of corporate performance. Yet many corporate boards are still dependent on traditional governance models that inhibit their ability to adapt quickly to rapidly evolving global, economic, regulatory and ESG-related challenges. This research study examines how strong data infrastructure supports the development of corporate boards that are agile and effective at governance. The study employs a qualitative and analytical research design by utilising an extensive literature review and the use of case studies of multinational corporations. Data system comparisons are also conducted through thematic analysis to assess the correlation between data systems, board agility and governance performance. Results of the study show that real-time data tools improve board decision-making, increase the speed of risk management, provide more accurate compliance monitoring, facilitate better ESG reporting, and enhance the board's engagement with stakeholders. While challenges such as data privacy, cyber-security, and inconsistent regulations remain, this research study demonstrated that a solid data infrastructure is a strategic enabler of sustainable, ethical and resilient corporate governance in the digital age.

Keywords: data infrastructure, agile boards, corporate governance, ESG integration, decision-making efficiency.

INTRODUCTION

In today's complex environment, corporate boards are faced with unprecedented challenges brought on by accelerating globalisation, technology disruption, evolving environmental, social, and governance (ESG) expectations, and an increasingly unpredictable regulatory environment. Although corporations have aggressively digitalised their operations and have invested in the automation of work, artificial intelligence systems, and sophisticated analytics, boards tend to be somewhat anchored in their use of analogue governance and oversight processes that are retrospective in nature, rather than examining strategic flexibility in an enterprise on a real-time basis.¹

This conundrum reveals a significant governance gap, with organisations developing highly sophisticated digital capabilities for the operations of work while board processes have remained traditional and episodic, aligned towards slower and more predictable eras. The purpose of this research is to demonstrate that data infrastructure is more than a technical tool or an IT issue; it is an essential governance capability that enables boards to achieve agility, accountability, and organisational ethical responsiveness amid the increasing complexity of operating in a digital era. In the context of this study, data infrastructure stretches beyond the typical definitions of databases and storage structures, but rather is an interconnected ecosystem that includes real-time analytics platforms, digital dashboards for oversight, integrated reporting that includes both financial and non-financial information, and data governance protocols to ensure accuracy of information used and ethical use of that information. This infrastructure sets the stage for governing bodies to move from being reactive monitors to proactive strategic partners who are timely in sensing new emerging risks, acting on new opportunities, and adaptive to changes in organisational direction.

Data governance, as a related infrastructure, provides an important component to this set of practices that establishes a policy and procedure framework to ensure that the organisational data is accurate, responsibly managed through a lifecycle, and actionable for decision-makers with appropriate authority.² At the level of governing bodies, if these governance systems are anchored into practice, governance expands from compliance functions to the dynamic

¹ Matthew Kosinski and Jim Holdsworth, 'What is Data Governance?' (IBM) <<https://www.ibm.com/think/topics/data-governance>> accessed 23 January 2026

² 'Corporate governance' (OECD) <<https://www.oecd.org/en/topics/policy-issues/corporate-governance.html>> accessed 23 January 2026

capabilities of adaptive stewardship. The research question that underpins this inquiry is simple yet urgent: how does strong data infrastructure create agility, inform decision-making and ethical efficacy for governing bodies in an era of digital transformation? To answer this question, consideration will be given not only to the technical features of a data system but also to the organisational, strategic and ethical considerations that enable governing bodies to use these capabilities in ways that build corporate resilience and stakeholder value.

STATIC OVERSIGHT TO DYNAMIC GOVERNANCE

The shift from static oversight to dynamic governance can be examined through several complementary theoretical perspectives that shed light on different aspects of the board-data infrastructure nexus. Agency theory, the traditional cornerstone of corporate governance scholarship, posits that boards are monitors whose central responsibility is protecting the interests of shareholders by overseeing managers and mitigating information asymmetries. Agency theory identifies data infrastructure as a mechanism to facilitate effective board monitoring. Boards require accurate, timely, and relevant information to monitor managerial performance, identify opportunism, and align managerial direction with the interests of shareholders. The integration of real-time data systems alters the agency paradigm by reducing information lag and facilitating continuous rather than periodic monitoring, thereby enhancing the board's ability to fulfil its fiduciary duties.³

Stakeholder theory takes the agency framework one step further by emphasising that boards are responsible for balancing the varying, and at times, conflicting interests of multiple constituencies such as shareholders, employees, customers, communities and the environment. Data infrastructure provides the necessary facilitation for this balancing act by promoting transparency across stakeholder dimensions: board members can monitor the organisation's performance on multiple metrics, including financial performance, environmental impact, social outcomes, and governance quality. Integrated dashboards that display the most relevant stakeholder-specific metrics enable boards to engage in balanced trade-offs in pursuing the organisation's goals, and to disclose more transparently to

³ Tejasvi Addagada, 'The Emergence of Corporate Data Governance' (*Dataversity*, 27 November 2023) <<https://www.dataversity.net/articles/the-emergence-of-corporate-data-governance/>> accessed 23 January 2026

stakeholders, consistent with increasing legitimacy and trust across the range of constituencies.⁴

Dynamic capabilities theory is perhaps the strongest theoretical lens for understanding board agility in the digital age. This theory views organisational success as being increasingly reliant on the capacity to sense changes in the environment, seize opportunities, and continuously utilise and redeploy resources and capabilities in response to changing conditions. Bottom line: applied to governance, this theory identifies data infrastructures⁵ as a 'meta-capacity' - a key resource that, given the capacity and frameworks for use, allows boards to develop and employ additional organisational competencies. Specifically, modern data systems help to enhance the boards' capabilities for environmental scanning (sensing); decision making in an agile environment (seizing); and resource mobilisation (transforming/adaptation). Rather than relying on quarterly reports or even the annual strategic review process, a board with access to real-time analytics can sense weak signals of new risks or opportunities, craft or evaluate strategic options using simulation-based scenario modelling, and orient the organisation to adapt outside of an annual or quarterly cycle.

The difference between pre-digital governance and agile governance models highlights this change beautifully. In the past, boards worked in a looking-backwards mode, approving historical financials and compliance reports on a fixed quarterly or annual basis. Their information environment included information delays, limited views into non-financial dimensions, and all of which came through the filters of management. Decision-making was either episodic or sequential – boards would receive information for consideration and decide at a point in time, mostly reacting to a situation that had changed by the time it was acted on. In contrast, agile boards can, in real-time, look to continuously updated dashboards that include financial, operational, ESG and risk information from across the enterprise. They leverage predictive analytics to deploy forward-looking scenarios, as opposed to solely looking at backward performance. They work through a continuous dialogue on their strategy, rather than episodic decision-making. This represents a shift from static oversight

⁴ 'What is data governance?' (SAP, 26 January 2026) <<https://www.sap.com/products/data-cloud/master-data-governance/what-is-data-governance.html>> accessed 23 January 2026

⁵ 'What is Data Infrastructure?' (Secoda, 16 September 2024) <<https://www.secoda.co/glossary/what-is-data-infrastructure>> accessed 23 January 2026

to dynamic governance of the board's reconceptualisation of being adaptive stewards from periodic auditors.

THE DATA INFRASTRUCTURE IMPERATIVE

Modern board data systems consist of different integrated elements that work in concert to change the governance capacity. At the centre is the integrated dashboard that pulls and visualises data from across the enterprise into dashboards that deliver on a single screen financial performance metrics alongside ESG indicators, operational KPIs, and risk alerts made available directly to board members. The dashboard replaces the highly fragmented and siloed information flows associated with traditional governance – separate financial reports, separate compliance updates, separate management presentations – and the board has coherent, real-time, synthesised overviews of organisational performance. Leading companies have also developed a more advanced version in the board portal, which grants customizable views to suit the different responsibilities of each committee while keeping a consolidated enterprise view.⁶

Predictive analytics is the second important component that enables boards to transition from descriptive hindsight to anticipatory foresight. Using statistical models and machine learning models on historical and real-time data, predictive analytics identifies patterns, spots anomalies, and provides possible future scenarios. For governance purposes, predictive analytics is now a way for governance boards to work through scenario planning (making decisions about strategic options under varying sets of assumptions about market conditions, future regulations, new competitors, etc). Predictive analytics can also provide early risk alerts, recognising growing threats before they become a crisis and allowing boards time to take preventative measures.

The third important aspect is AI-assisted compliance monitoring and sentiment trending, which automates standard oversight processes and supports human judgment on much more complicated issues. These systems are constantly in compliance requirements, potentially threatening compliance, and alert the board of directors to risks associated with regulatory violations or lack of knowledge concerning their control environment as they

⁶ 'What Is Data Infrastructure? A Simple Overview' (*Fortra*, 12 February 2024) <<https://www.digitalguardian.com/blog/what-data-infrastructure-simple-overview>> accessed 23 January 2026

relate to compliance. Sentiment trending tools can also assess stakeholder sentiment through social media and news articles, employee feedback, etc., which can provide boards with advanced notice of reputational risk or stakeholder issues that may not otherwise be visible.⁷

In these technological capabilities, we see practical changes to the nature and focus of board discussions. Traditional board meetings were focused on reporting on what happened or previously happened—reviewing financial statements from the prior quarter, assessing compliance against historical compliance requirements, and assessing management's views on past performance. Modern data-enabled boards move from reporting on what happened to reporting on what is happening—reviewing operational dashboards in real-time, assessing contemporary market conditions, and assessing current stakeholder issues. Most fundamentally, advanced data infrastructure enables boards to move from reporting on present situations to reporting on what may happen—predicting various futures, stress-testing strategies and conveying preparations for relevant contingencies.

Leading organisations have provided examples of the strategic value these systems can have on the governance process. Microsoft is now using data-driven governance through the adoption of company dashboards for the board. These dashboards provide views of the company's financial performance, cloud computing metrics, cybersecurity health, assessments of ethical usage of AI, and monitoring of carbon emissions. The board is updated on these metrics in nearly real-time between meetings, and with the touch of a button, the dashboards can be drilled down to see specific metrics and data and understand areas of concern. Unilever created a real-time dashboard that integrates sustainability across a myriad of global operations and provides board-level oversight of its environmental impacts, allowing the board to continuously monitor progress against sustainability commitments and adapt in real-time to sustainability challenges as they arise. The DBS Bank in Singapore, the largest financial institution there, re-imagined governance with digital boards providing risk dashboards that potentially show real-time risk events; predictive analytics of credit and market risks; and automated compliance metrics and monitoring across regulatory jurisdictions. Siemens created an enterprise-wide data governance framework to provide

⁷ 'Data Governance: Building Effective, Role-Driven Systems' (Fortinet)
 <<https://www.fortinet.com/resources/cyberglossary/data-governance>> accessed 23 January 2026

board members with uniform access to operational, financial, and ESG data, providing enhanced ability for higher and diverse oversight of strategy.

The strategic effects visible across these examples include a very significant shortening of decision cycles; each of these instances made it possible for the time from identifying an issue to deciding to be reduced from weeks or months to days and sometimes even hours in emergency contexts. With the ability to monitor critical circumstances that need immediate attention, boards can monitor the state of affairs in a way which was not possible before digital records—they can do so continuously rather than waiting for the next monthly or bi-monthly meeting, which enables immediate action to be taken when necessary. Similarly, the improved disclosures of ESG included in firms' reports are attributable to the automated gathering and reporting of ESG performance metrics through information systems that support accuracy, consistency and auditability (compared to non-automated systems). Collectively, these changes transform boards from periodic oversight organisations into continuous strategic partners who also add value in real time to managers and employees in organisations.

DATA-DRIVEN AGILITY: REFRAMING BOARD EFFECTIVENESS

The connection between data literacy and board agility is a significant factor behind governance effectiveness in the digital age. A board can make strategic decisions at a rate of about 40% faster with digital dashboards and board training relative to boards using traditional means of obtaining information. This speed is indicative, not simply in a faster speed of getting information, but fundamentally different decision-making processes—boards with real-time data move directly from identifying issues to informed deliberation, without going through the sequential information-gathering and analysis steps common in traditional governance.⁸

More importantly, data infrastructure means boards can proactively govern around risk, rather than reactively around compliance. Traditional governance focused on compliance, which was deemed more important to governance aesthetics. Furthermore, compliance focused on compliance—it did not inherently advocate for proactively managing risk.

⁸ Nontokozo Cynthia Msibi et al., 'Designing Digital Dashboards for Business Performance: Principles and Evidence' (2025) Preprint Research Square <<https://doi.org/10.21203/rs.3.rs-7817897/v1>> accessed 23 January 2026

Traditional governance was a backwards-looking process, focused on making sure others adhered to the rules – whether they were to control risk or boards to control violations of the same. Data-laden boards can advance to anticipatory management of risk and compliance – using analytics designed for observing future real-time events that could lead to risks prior to their creation, rather than waiting to identify and react to the rule violations later on. This new orientation represents a qualitative change in the board's effectiveness in governing, by taking care of damage by not even considering or advocating for the one criticism of governance action – risk to the assets of the organisation.

The various dimensions of governance agility, or how quickly the board can respond to indications from data suggesting changes in market conditions, competitive dynamics or stakeholder expectations, encompass strategic agility. Working with time-sensitive indicators, agile boards do not bind themselves to multi-year strategic plans, which quickly become irrelevant as conditions change. Instead, they continuously update strategies by considering movement towards a new strategic direction over time and are generating an updated strategy based on real-time feedback, while still maintaining a coherent and consistent longer-term aspirational direction. Agility is further supported through the board's data infrastructure, which provides boards with ongoing visibility into strategy implementation and situational monitoring of change, allowing for prompt changes and course correction before drifting into a crisis.⁹

Operational agility is the capability to make collective decisions as time and space become streamlined in the event of a crisis. Digital collaboration tools allow boards to deliberate and decide collectively without being physically together. This creates a way for board members to review meeting materials and data, share alternative views, and make decisions in less time than coordinating physical meetings. In crisis conditions - such as a pandemic, cybersecurity event, or market event - operational agility is invaluable, enabling boards to come together virtually, access data at the time of the meeting and make decisions urgently.

Regulatory flexibility improves the capacity of boards to monitor compliance on an ongoing basis and allows for rapid and effective responses as legal and regulatory obligations change, particularly in the areas of ESG reporting, the ethics of AI, and consumer data privacy. In an

⁹ Addagada (n 3)

increasingly volatile and complex international regulatory environment, automated compliance systems will monitor regulatory updates, evaluate compliance, and notify boards of any compliance gaps and issues, thereby providing boards with the information they need, when they need it, and eliminating any delays from manual processes. A robust data infrastructure supports efficiency and ethical oversight by providing transparency for forever accountable and auditable decision trails. These records serve as evidence of analyses and discussions around decision-making on behalf of the organisation, providing accountability and a mechanism to review the decision with regulators or stakeholders. This level of transparency not only builds trust but also shows that board-level decision-making occurs in a rational manner through good evidence and analysis instead of solely through discretion.

ESG INTEGRATION THROUGH DATA INFRASTRUCTURE

The urgency for ongoing, integrated ESG reporting has increased substantially because investors, regulators, and other stakeholders expect companies to provide systematic accountability not only for traditional financial results but also for the environment and social performance. Data infrastructure is essential to meeting stakeholder expectations by consolidating siloed environmental performance (carbon emissions, water use, waste generation), social performance (diversity data, labour practices, community engagement), and governance oversight (board composition, executive compensation, ethics violations) into digestible dashboards for board members.¹⁰

This consolidation marks a significant leap forward from ESG reporting that relies on human work, where data is collected at different intervals, and the methodology is inconsistent and not completely verifiable, to ESG metrics that are in a board portal and automated, with trustworthy verifiability. Traditional ESG reporting generally consisted of sustainability value team numbers from different means, after which sustainability teams would input numbers and complete the calculations to generate a stand-alone annual or quarterly ESG report that was not linked to financial reporting. Traditional ESG reporting also suffered from time lags, calculation errors, and difficulties validating numbers reported. Today's data

¹⁰ Victoria Agbakwuru et al., 'The Impact of Environmental, Social, and Governance (ESG) Reporting on Corporate Financial Performance' (2024) 5(9) *International Journal of Research Publication and Reviews* 3629 <<https://doi.org/10.55248/gengpi.5.0924.2710>> accessed 23 January 2026

infrastructure automatically provides ESG data through Internet of Things (IoT) sensors that measure environmental impacts; HR systems that capture social metrics; and governance systems that monitor compliance-related behaviour. Automated calculation and validation processes provide data accuracy and empower sustainability officers by giving them very little burden to validate data, and will potentially connect it into the board information systems that will provide impacts and considerations near real time and with the same data to the board's visibility into ESG impact alongside.

Concrete examples illustrate these capacities. For instance, Unilever has generated an extensive dashboard for monitoring sustainability in near real time, allowing board members to see performance data across hundreds of sites internationally. These dashboards track the company's progress against ambitious sustainability commitments, signal sites performing poorly against targets, and allow decisions to be made quickly when issues arise. Board committees overseeing sustainability use these dashboards to monitor strategy implementation on a continuous basis rather than relying on more traditional reports outlining performance. The transparency achieved through near-real-time data also builds greater accountability to meet sustainability goals.¹¹

Microsoft introduced a unique carbon ledger system using blockchain technology to establish immutable records of carbon emissions across its global operations. The carbon ledger provides the board with verified, auditable data of its stated goal to achieve carbon negativity, as well as information related to decisions on renewable energy investments and operational adjustments to reduce emissions. Microsoft also created an AI ethics board that is supported by comprehensive data systems that track products and services rolled out with AI developments, track potential ethical issues, and allow the AI ethics board oversight on responsible AI development. These governance mechanisms illustrate the means by which data infrastructure enables boards to exercise some meaningful oversight of complex environmental, social, and governance dimensions that would be more difficult to oversee through more traditional governance mechanisms.

The governance benefit that arises from a strong ESG data infrastructure is shown in a few different areas. The first benefits of increased stakeholder trust result from the transparency

¹¹ 'ESG Microsite' (Hindustan Unilever Ltd) <<https://hul-performance-highlights.hul.co.in/performance-highlights-fy-2024-2025/esg-initiatives.html>> accessed 23 January 2026

and verifiable accountability the company offers – when companies can demonstrate real-time data to support their ESG claims – rather than relying on qualitative claims to judge that the organisations have made real commitments to ESG, stakeholders trust that they have. Better auditability addresses the questions arising from the pressures of regulations around ESG reporting and the need for even more compliance – the automated data capture and processing, provided by an ESG infrastructure, makes sure there is an auditable trail to verify compliance and minimises the risk of greenwashing. Greater transparency, for a company's internal Board of Directors and external stakeholders, strengthens the Board's ability to meet fiduciary obligations to beneficiaries and meet stakeholder trust regarding corporate responsibility. Altogether, these benefits promote the development of the ESG data infrastructure from a regulatory burden to a strategic asset for corporate reputation, stakeholder engagement, and value creation.

BARRIERS AND ETHICAL TENSIONS

While there are undeniable benefits to advanced governance data infrastructure, organisations have significant barriers to overcome in order to fully utilise these innovations. The largest barrier, of course, is privacy and cybersecurity. Governance systems capture strategic, financial, and competitive data that is often extremely sensitive – everything from M&A negotiations, succession planning, and compliance – where a breach could result in staggering costs. Ironically, the increased accessibility that connectivity affords organisations simultaneously increases exposure to sophisticated cyber threats, making boards prime targets for cybersecurity threats. Consequently, organisations need to implement strict safeguards, including encryption, multi-factor authentication, and real-time threat detection, which complicate deployment and significantly increase costs. In addition, regulatory inconsistency complicates global adoption, especially for multinational corporations. Quite simply, the disparate data protection regimes – compared to the EU's stringent privacy laws – in other jurisdictions such as the US or China create compliance challenges and uncertainty in some organisations' governance practices. Similarly, ESG disclosure

requirements vary considerably across jurisdictions – metrics, verification, and reporting timelines – all of which are difficult and cumbersome for global boards.¹²

Another significant challenge is the board's digital skills gap. Board members bring mature expertise in traditional sectors, but many lack data analytics, dashboards, and AI skills that would allow them to accurately assess and utilise digital insights. For organisations, this means finding a way to invest in the sustained digital literacy and formal training that will generate data-gathering oversight capabilities, as technology is always going to change. On top of practical hurdles, there are ethical governance challenges. Data analytics driven by AI can embed bias and obfuscate accountability for action (i.e., they can amplify discrimination or make decisions in ways boards cannot account for or defend). The over-reliance on AI and automation also creates the possibility that judgment and accountability may be diminished where the decision itself is complex and tied to ethics, mission, and values.¹³

To combat these issues, boards need to think about meta-oversight, or the ethics of governing the governance of data. This means creating a set of practices around the use of AI that will engender trust, such as using clearly defined source and algorithm information, maintaining human and ethical accountability for automated systems, critical review of AI outputs, and repeated audits for bias or incorrect information. Without these processes, boards run the risk of denying their accountability and ethical obligations.

TOWARD A MODEL OF DATA-ENABLED AGILE GOVERNANCE

Based on the prior discussion, a theoretical model develops a causal chain by which data infrastructure improves governance performance and creates stakeholder value. The sequence of this model can be stated in the following order: Data Infrastructure → Board Agility → Governance Performance → ESG and Stakeholder Value.¹⁴

¹² Paul Menoret-Renard and Edward Nkune, 'It's all about the data - regulatory barriers to cross-border investigations' (*Lexology*, 17 December 2024) <<https://www.lexology.com/library/detail.aspx?g=1d4bdbbd-03e9-45e7-8b19-fee11f628b04>> accessed 23 January 2026

¹³ David Acev et al., 'Systematic analysis of data governance frameworks and their relevance to data trusts' (2025) 75(2) *Management Review Quarterly* <<https://doi.org/10.1007/s11301-025-00545-1>> accessed 23 January 2026

¹⁴ Huanyong Ji et al., 'Does environmental, social, and governance (ESG) performance lead to ambidextrous innovation? Integrating stakeholder and institutional theories' (2025) 10(5) *Journal of Innovation & Knowledge* <<https://doi.org/10.1016/j.jik.2025.100804>> accessed 23 January 2026

At the outset, data infrastructure is composed of the integrated technology systems, governance processes, and organisational capabilities that enable boards to receive accurate, timely, relevant information for the strategic oversight of the organisation. Data infrastructure has a technical dimension, as represented by the analytics platforms, dashboards, and automated monitoring systems in the governance file. Data infrastructure also has an organisational dimension, included in data governance policies, digital literacy initiatives, and organisational protocols protecting secure access to information. Together, strong data infrastructure allows governance to develop three essential governance capabilities: transparency through visibility into combined financial and non-financial performance of the organisation; timeliness through real-time or near-real-time information flows that alleviate lag time in decision-making; and analytic capacity that provides boards with the tools for identifying multidimensional patterns, scenario modelling and deeper insights from complex data.

With these foundational capabilities, it is possible to achieve board agility, the second stage in the causal model presented. As noted in previous discussions, agility manifests as adaptive, informed, and ethical decision-making across strategic, operational, and regulatory dimensions. When boards have strong data infrastructure, they respond faster to emerging challenges and opportunities, engage in continuous strategic activity rather than episodic engagement, and navigate complex regulatory environments. A key ingredient in data-enabled agility is having an ethical responsiveness—boards are able to identify stakeholder concerns and respond quickly to them, as their decisions come into view for adjusting around organisational values and societal expectations.¹⁵

Board agility, in turn, drives improved governance performance, the third stage in the model. Governance performance improvements can be seen as responsiveness improvements—boards provide timely guidance to management and can be effective interveners if they need to be. Integrity can be enhanced, as whole data trails create accountability, and transparent decision-making creates stakeholder trust. Risk management capacities are improved through early identification and proactive mitigation instead of reactive crisis management. Strategic oversight is improved as boards have the capacity to engage in continuous

¹⁵ Wenxue Yi & Seung Woon Kim, 'The Impact of IT Capabilities on Organizational Agility With the Moderating Effect of Organizational Learning' (2025) 13 IEEE Access
<<https://doi.org/10.1109/ACCESS.2025.3542575>> accessed 23 January 2026

alignment of organisational activities to strategic objectives, applying course corrections before later having a significant crisis.

The result—improved ESG and stakeholder value—will be realised through good governance performance. Good governance produces financial value by fulfilling strategic alignment, minimising risks, and creating competitive advantages via improved decision-making. At the same time, strong governance improves ESG performance via enhanced environmental management, social outcomes, and governance practices that increase stakeholder trust. These combined benefits converge on the sustainable long-term value creation that serves multiple stakeholders while remaining financially sustainable. This causal model can be envisioned as a governance maturity framework with three progressive governance levels. Reactive governance, the epitome of traditional governance, is geared to ensure compliance with prescriptive rules and address issues once identified. That is, boards are backwards-looking, examining performance of the past and addressing issues once they have occurred.¹⁶

Predictive governance, heralding intermediate maturity, incorporates data analytics to reveal emerging risks and opportunities. That is, boards use data to move from merely responding to what has transpired in the past to preparing for the possible future events to come. Adaptive stewardship, or simply stewardship, the most mature form of governance, involves continuous refinement of strategy based on real-time feedback. That is, boards become active strategic partners that participate in the organisation's continual adaptation to evolving environments while remaining ethical in stewardship approaches to ensure that stakeholder expectations are managed.

POLICY AND PRACTICE IMPLICATIONS

The established framework, along with its insights, has significant implications for corporate governance and public policy. Regarding corporate governance, organisations will need to develop their data infrastructure strategies at the board level and independent from their information technology responsibilities. Board data systems are different from IT systems,

¹⁶ Sofik Handoyo and Syaiful Anas, 'The effect of environmental, social, and governance (ESG) on firm performance: the moderating role of country regulatory quality and government effectiveness in ASEAN' (2024) 11(1) *Cogent Business & Management* <<https://doi.org/10.1080/23311975.2024.2371071>> accessed 23 January 2026

which are typically used to manage operational issues and information technology responsibilities. Board data systems are designed to support strategic insights, synthesised information, and metrics aligned with governance oversight. Companies will be expected to develop board technology committees or allow one of the current committees such as the audit committee or risk committee to take on this responsibility, such committees will need to determine board information needs, determine reputable technologies to install and implement, and to monitor the effectiveness of the board data governance system while ensuring the system is supporting the board's governance oversight responsibilities.¹⁷

The second significant governance requirement emerging from the foregoing framework is the need for directors to build their digital literacy. Many boards consist of members with little to no knowledge of data tools, artificial intelligence, and digital governance tools. Companies will then need to establish onboarding and continuous learning frameworks for directors to stay on top of the changing landscapes of digital technologies. Some of the leading companies already have structured programs with local business schools or technology companies that offer workshops or specialised learning programs to provide general learning and development opportunities for their board directors and to expand their knowledge of the governing implications of emerging technologies. Creating data governance committees at the board level creates an organised mechanism for oversight of their use in governance. Committees could define data access protocols, oversee cybersecurity, ensure ethical analytics using AI and act as a liaison between the board of directors and data management team. The need for dedicated oversight is now critical, given the increasing strategic importance of data.

Regulators should focus their efforts on ensuring international transparency standards for board data. Having harmonised, global frameworks that promote oversight, such as those endorsed by IOSCO and the Financial Stability Board, would lessen compliance burdens and allow boards to focus on strategic oversight instead of navigating a patchwork of regulations. Regulators should similarly encourage the harmonisation of ESG Data taxonomies to support consistency and comparability across frameworks like GRI, SASB, TCFD, etc. Finally,

¹⁷ Tejasvi Chandrarkar Addagada, 'CORPORATE DATA GOVERNANCE, AN EVOLUTIONARY FRAMEWORK, AND ITS INFLUENCE ON FINANCIAL PERFORMANCE' (2023) 6(1) Global Journal of Business and Integral Security 1 <<https://www.gbjs.ch/index.php/gbis/article/view/141>> accessed 23 January 2026

establishing ethical frameworks for AI and Data Governance while in use is also necessary. Collaborative guidelines based on principles of transparency, accountability, simplified bias reduction, and continued human oversight beyond Data Governance, defined Data and AI values, will provide a sustainable path to responsibly allowing technology to govern workflows while respecting the ethical practice of governance in an increasingly digital world.¹⁸

CONCLUSION

This research shows that strong data infrastructure functions as a governance capability that supports boards to be agile, transparent, and ethically oriented in complex digital contexts. Data from leading organisations shows that using dashboards, predictive analytics, and automated compliance systems improves the speed at which boards can make decisions, reduce risk, and enhance environmental, social, and governance (ESG) integration. The conceptual model aligning data infrastructure supports board agility, governance performance, and stakeholder value, both of which contribute to theoretical development and offer practical insight for corporate modernisation.

However, addressing the implementation challenges (including cybersecurity risk, regulatory anomalies, and director gaps in digital literacy) will require a holistic approach considering the investment in technologies, as well as developing ethical frameworks alongside the education of directors. Policymakers should promote global harmonisation of data governance standards and ESG reporting protocols to establish greater compliance while enhancing sophistication and transparency with data. As boards transition from episodically monitoring compliance to responsive and adaptive citizenship, data infrastructure provides the basis for boards to effectively fulfil their fiduciary responsibility while realising sustainable stakeholder value, built on the premise of an integrated global economic context.

¹⁸ *Methodology for Assessing Implementation of the IOSCO Objectives and Principles of Securities Regulation* (International Organization of Securities Commissions 2017)