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Strategic Governance Communication and Green Indicators for Digital Business Sustainability

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ABSTRACT

Objective: Digital transformation drives innovation and efficiency, but also increases emissions, e-waste, and inequality. This study introduces Communicative Green Governance, a framework linking sustainability with transparent, ethical, and participatory communication.

Methods: This study employs a qualitative systematic review in five stages to investigate how digital businesses formulate, reveal, and convey green governance indicators in relation to digital sustainability objectives. Using the Penetit Indicators—transparency, coherence, dialogue, and ethics—the research analyzes sustainability narratives of Google, GoTo, Grab, and Shopee through discourse and framing analysis.

Results: Effective green governance depends not only on Environmental, Social, and Governance (ESG) performance but also on credible, interactive communication. Google exemplifies transparency, while Shopee faces greenwashing and inconsistency.

Conclusions: The study concludes that digital sustainability's future lies not in technology alone but in ethical, transparent communication that shapes long-term societal impact.

Keywords: sustainability communication, digital green governance, ESG, organizational legitimacy, communicative governance, transparency.

1. INTRODUCTION

In this rapid pace of digital change, the author often reflects on how seemingly limitless innovation can generate serious environmental challenges. The global digital sector has been reported to contribute approximately 0.8% of the world's total energy-related emissions by 2023 through the operations of 166 major digital companies (International Telecommunication Union & World Benchmarking Alliance, 2025). This means that even as organizations adopt paperless and cloud-based systems, a substantial carbon footprint remains. In 2023 alone, 164 digital organizations consumed around 581 TWh of electricity.

However, while digitalization promises efficiency, connectivity, and convenience, it also creates new environmental burdens. Many assume that higher efficiency automatically leads to lower environmental impact; yet this perception overlooks the hidden costs of energy consumption and resource extraction. The question of sustainability, therefore, is not only about reducing emissions but also about how such actions are publicly perceived—whether they represent genuine accountability or serve as rhetorical slogans. This paradox of digitalization becomes even more apparent when considering that technological advancement does not necessarily equate to reduced emissions. The information and communications technology (ICT) sector alone contributes between 2.1% and 3.9% of global greenhouse gas emissions, a figure nearly equivalent to that of the aviation industry (EY, 2023).

With the rapid expansion of large-scale data centers and the rising electricity demands of cloud services, digital organizations face a growing dilemma: increasing capacity to support innovation and user services while simultaneously expanding their environmental footprint. Modern data centers require intensive cooling systems, backup diesel generators, and complex network infrastructure—all of which contribute significantly to Scope 2 emissions. The compromise lies in realistic and open communication. Transparent dialogue about sustainability goals is essential to avoid the assumption that digitalization is inherently environmentally friendly.

Current environmental and social transitions demand that organizations address the ethical ambiguity that arises in the digital ecosystem. This requires balancing environmental responsibility with credible and transparent communication—not only operating sustainably but also communicating sustainability credibly across diverse audiences. Many stakeholders, from consumers to investors, are no longer satisfied with organizations that merely announce net-zero targets for 2030 without providing verifiable evidence or coherent narratives. A recent report revealed that, among 200 leading digital companies, while most have set emissions-reduction targets, many still fail to fully disclose their Scope 3 (value chain) emissions (International Telecommunication Union & World Benchmarking Alliance, 2024).

Given this context, the communication function must evolve beyond simple information dissemination. It should not only convey results but also foster dialogue, signal future directions, acknowledge uncertainties, and demonstrate accountability. This study examines how communication managers and strategists interpret sustainability data and construct narratives that

shape stakeholder perceptions and decision-making. Although numerous studies discuss carbon emissions, energy use, and e-waste, relatively few explore how these sustainability impacts are communicated and negotiated with the public. This gap presents an important opportunity for communication scholars. Discussions that focus solely on indicators without considering how they are framed or delivered may inadvertently lead to perceptions of greenwashing or fragile legitimacy. Against this backdrop, this chapter emphasizes the need to understand communication not merely as a reporting tool but as an integral component of organizational governance. This study focuses on how the communicative governance framework operates within digital organizations implementing green indicators. Communication is examined here not as an instrumental process but as part of governance itself—rooted in dialogue, credibility, accountability, and coordination among diverse actors. The research explores how digital organizations develop and disseminate green indicators, how stakeholders interpret these messages, and how legitimacy is established or undermined through communicative practices. Through this reflective and empirical approach, the study seeks to understand not only the numbers behind sustainability but also the meanings embedded within digital narratives.

From a pedagogical standpoint, when the author teaches communication courses, students are often encouraged to analyze digital companies' sustainability reports by asking:

- What metrics are presented?
- What language is used?
- Who is the intended audience?
- And to what extent do stakeholders participate in the dialogue?

Such evaluations consistently lead to deeper reflections on corporate transparency and authenticity.

- Are companies genuinely accountable, or are they engaging in rhetorical performance?

Organizations that can effectively measure, frame, and communicate their sustainability indicators will be better positioned to navigate environmental and social challenges. In contrast, organizations that rely solely on quantitative disclosures without open dialogue risk skepticism and declining trust. Building on these reflections, this study aims to make both theoretical and practical contributions by helping communication practitioners and organizational leaders understand how communicative strategies can shape, sustain, and legitimize green digital governance.

2. LITERATURE REVIEW

2.1. Green Governance in Digital Enterprises

Behind every digital screen lies an expanding carbon footprint driven by increasingly intelligent algorithms. Digital companies are no longer evaluated solely by the speed of their innovation but

also by their ethical capacity to manage the ecological consequences of their operations. The ESG principles—Environmental, Social, and Governance—have become the global framework guiding this transformation. According to the *PwC Global Investor Survey* (2024), more than 79% of investors worldwide now consider ESG performance before allocating their funds, and approximately 62% of major technology companies have integrated ESG goals into their digital business strategies.

However, embedding ESG principles requires more than producing lengthy environmental reports. It demands an integrated system that aligns environmental management with digital innovation. In this context, this study observes that leading global technology corporations such as Microsoft and Google have emerged as pioneers in translating green governance into practice. Microsoft, for instance, has pledged to become carbon negative by 2030 and to eliminate its historical carbon footprint by 2050 (*Microsoft Sustainability Report*, 2024). This commitment extends beyond ethical symbolism; it reflects strategic integration, in which software design, data center management, and supply chain operations are evaluated within a sustainability continuum.

Despite this progress, a fundamental paradox persists: the exponential increase in data processing required for artificial intelligence has led to an alarming rise in energy consumption. A study by the *International Energy Agency* (2024) reports that global data centers now consume more than 460 terawatt-hours (TWh) of electricity annually—nearly equivalent to France's total energy demand. This demonstrates that even the most environmentally conscious digital operations, if not carefully managed, can contribute to uncontrolled energy use.

At the same time, e-waste management poses a persistent environmental challenge. According to the *Global E-Waste Monitor* (United Nations, 2024), Indonesia alone produces approximately 62 million tons of electronic waste annually, with only 22% successfully recycled through formal systems. Much of this waste results from frequent device upgrades and the rapid obsolescence of network infrastructure. Companies such as Apple have introduced closed-loop recycling initiatives using technologies like Daisy, a robot that disassembles iPhones to recover valuable components. Yet, such systems remain limited in global adoption and have not significantly transformed industry-wide recycling practices.

Another emerging dimension of green governance lies in addressing ethical challenges in artificial intelligence. The question of “ethical AI” sits at the intersection of governance, technology, and human values. As algorithms increasingly inform decisions in finance, transportation, and public policy, concerns arise regarding fairness, bias, and social accountability. The *World Economic Forum* (2025) notes that over 70% of global digital organizations have yet to establish a comprehensive ethical AI framework, and only a small minority engage the public in policymaking processes. Without a strong ethical foundation, sustainable digitalization risks becoming an illusion. Thus, green governance must extend beyond environmental efficiency to encompass ethical responsibility—the commitment to ensure that technological development remains aligned with human values.

In practice, green governance highlights the trade-offs between digital innovation and environmental responsibility. For example, Google Cloud has developed carbon-intelligent computing systems that shift data workloads to times and regions with higher availability of renewable energy. Such innovations illustrate how artificial intelligence and sustainability objectives can reinforce rather than contradict one another. Yet the critical question remains: to what extent are these initiatives communicated transparently to the public and stakeholders? Effective sustainability communication requires more than corporate branding or storytelling—it involves constructing an architecture of trust that enables people to understand, engage, and participate in the broader goals of digital transformation.

From a social perspective, green governance also addresses the inclusivity gap in digital literacy and access. The *UNESCO Digital Inclusion Report* (2024) highlights that more than 2.6 billion people remain disconnected from the internet, perpetuating a digital divide with significant economic and social implications. In this sense, digital sustainability cannot be measured solely through emission reductions or recycling rates, but also by assessing how digital technologies bridge social inequalities. The case of Safaricom's *M-PESA Green Energy* program in Kenya demonstrates how digital innovation can function as a tool for empowerment. By integrating solar energy with financial inclusion initiatives, Safaricom exemplifies how ESG principles can drive both environmental and social progress.

Ultimately, green governance within digital organizations seeks to align technological efficiency with ethical and sustainable values—linking innovation to moral accountability. It transcends annual ESG reports or ISO environmental certifications, offering instead a paradigm that redefines how organizations perceive power, responsibility, and the digital future. Governance, in this perspective, should not be viewed merely as oversight, but as a continuous ethical process involving the interplay of humans, machines, and the planet. In the age of data, algorithms, and media intermediation, sustainability begins at the point of everyday interaction—each click, byte, and policy decision contributes to the story of how humanity coexists with the Earth.

2.2. Communicative Turn in Governance Theory & Communication is Crucial for Sustainability Governance

This study begins with a simple yet fundamental reflection: can organizations truly govern without communicating? The paradigm shift from governance as control to governance as communication is transforming how we understand power, legitimacy, and social coordination. Traditionally, governance was perceived as a hierarchical mechanism that dictated behavior through rules and procedures. In contrast, contemporary organizations—particularly digital ones—operate as dynamic webs of ongoing conversations. Communication theorists such as Heath (2018), Cornelissen (2023), Christensen & Cooren (2012) argue that organizations are not merely communicators but are constituted through communication itself—a concept known as the communicative constitution of organizations (CCO).

From this perspective, governance is not simply a system of control; it is a communicative process through which shared meanings, values, and beliefs are co-created among interconnected actors. In the digital realm, this process becomes even more evident, as decisions, perspectives, and even the corporation's identity emerge from continuous interactions among data, algorithms, and human dialogue. In practice, the communicative turn in governance requires organizations to recognize that power resides not in formal authority, but in their capacity to align meanings across diverse stakeholders.

When Apple decided to replace the phrase *"carbon neutral"* with *"low-carbon innovation"* in its corporate vision (Apple, 2024), it symbolized a shift from administrative control to communicative value creation. Similarly, Patagonia demonstrates that communication is not merely informational but moral—an act of collective persuasion grounded in shared responsibility. This aligns with Christensen and Cornelissen's (2021) argument that modern governance cannot succeed without processes of meaning-making that enable organizations and publics to negotiate what is considered ethical, legitimate, and socially responsible.

In today's global environment, characterized by ecological volatility and technological acceleration, communication becomes a contested space where regulation and expectations are constantly evolving. Digital corporations such as Meta and Google no longer merely issue privacy or energy policies—they must also publicly communicate and justify them. Accountability now extends beyond operational efficiency to include the narrative of responsibility itself: transparency efforts, renewable energy investments, and innovation strategies must all be communicated in ways that sustain legitimacy. For instance, Meta has faced criticism for its rising energy consumption, which reached 10.9 million megawatt-hours in 2024 (*Meta Sustainability Report*, 2024). As Cooren (2018) notes, organizations "speak" through their presence—through the data they generate, the metrics they disclose, and the narratives they articulate.

This reorientation toward communicative governance also reshapes how we interpret the future of ESG. While ESG (Environmental, Social, and Governance) indicators are often treated as neutral and quantitative, they are, in essence, communicative artifacts. These indicators convey identity, values, and aspirations—they tell a story about who the organization is and what it strives to become. For example, Microsoft's *ESG Report* (2024) not only presents emissions data but narrates the human, technological, and ethical implications of each initiative. This is communication as governance: transforming data into shared meaning and collective understanding (Heath, 2018). When metrics are explained transparently, numbers cease to be mere statistics; they become narratives of values and commitments.

Effective sustainability communication thus serves as a bridge between data and meaning, between reporting and real action. Strategic communication transforms ESG data from corporate documentation into a participatory discourse that invites dialogue, oversight, and critique. Unilever's *Climate Transition Action Plan* exemplifies this by inviting public feedback from shareholders, thereby advancing a rare form of participatory governance. By doing so, Unilever

not only reported progress but also legitimized its moral purpose through openness and dialogue. In an age of skepticism toward corporate intentions, communication becomes the minimum ethical requirement for credibility.

Nevertheless, communicative governance also entails significant risks. The Volkswagen *Dieselgate* scandal stands as a stark reminder of how manipulative communication can erode institutional legitimacy rapidly. When falsified emission data were exposed, public trust collapsed, market value plummeted, and organizational credibility disintegrated. The case underscores that governance based solely on control—without communicative transparency—invites moral distortion and systemic failure. In contrast, communicative governance offers a more ethical alternative: transparency, dialogue, and reflexivity as the mechanisms that sustain organizational legitimacy (Christensen, 2020).

The significance of communication in sustainability governance is not merely theoretical but existential. In a world defined by data acceleration, communicative strategies serve as a profoundly human means of maintaining relationships between organizations and society. When digital companies speak about sustainability, they are, in essence, articulating a shared future—how today's business choices will shape the planet and its next generations. Reflective and participatory communication, therefore, is not only a tool of legitimacy but a manifestation of integrity. As Heath (2018) reminds us, communication governs meaning—and in an era marked by a crisis of meaning, communication emerges as the most vital source of power for sustainable governance.

2.3. Overview of Green Governance Indicators

When reading sustainability reports from digital corporations, one often experiences a mix of admiration and skepticism. The ESG indicators—covering carbon emissions, energy efficiency, e-waste management, digital inclusivity, and ethical AI implementation—appear impressive at first glance. Yet beneath these numbers lies a deeper question: do such indicators genuinely reflect authentic green commitments? According to the *Global Reporting Initiative* (GRI, 2024), although more than 90% of Fortune 500 companies now publish ESG reports, only 38% publicly disclose their calculation methodologies. This suggests that many corporations operate in a semi-transparent realm—appearing objective but lacking full accessibility and interpretive clarity for the public.

Here lies the core dilemma of green governance: the tension between scientifically assessing environmental performance and ensuring that those assessments are meaningful and accessible to stakeholders. Carbon emissions, for example, have become emblematic of the digital era's moral paradox. Microsoft's 2024–2025 annual report claims an 8.2% reduction in Scope 1 and 2 emissions; however, Scope 3 emissions rose temporarily due to the expansion of cloud

computing and AI infrastructure (Microsoft, 2024). These figures are not merely statistical—they embody complex trade-offs and contradictions that are rarely communicated transparently. Similarly, Apple reports that 45% of the metal content in its products is now recycled (Apple, 2024), yet a *United Nations University* (2024) study indicates that only 22% of global e-waste is effectively processed through formal recycling systems. This persistent gap between corporate narratives and global realities reveals not the absence of data but the absence of communicative integrity in ESG discourse.

Technical vocabulary—such as *carbon offsets*, *net-zero trajectories*, and *AI-driven energy optimization*—has become the new rhetoric of sustainability. While these terms enhance corporate credibility, they often alienate the public from understanding the substance of environmental accountability. The *Edelman Trust Barometer* (2025) found that 61% of respondents worldwide perceive corporate sustainability communications as overly complex and insincere. This is not a failure of measurement but a failure of meaning. Data that is not effectively communicated loses its transformative capacity. In this sense, transparency must go beyond disclosure; it must cultivate understanding, invite dialogue, and foster mutual accountability.

From a communicative governance perspective, green governance evolves from data dissemination to meaning representation. What truly sustains legitimacy is not the amount of information released, but how that information is framed, contextualized, and ethically communicated. Effective sustainability narratives do not merely report achievements; they disclose dilemmas, acknowledge uncertainty, and engage publics in collective reflection. For instance, when Unilever and Google began integrating interactive ESG dashboards into their reporting systems, they created new opportunities for stakeholders to trace, question, and learn from corporate sustainability actions in real time. This type of *traceable transparency* transforms ESG indicators into dialogic tools—bridging the gap between corporate accountability and societal trust. Ultimately, communicative green governance calls for organizations to move beyond performative disclosure toward *interpretive transparency*—a model that combines honesty with accessibility. Reports should not only demonstrate progress but also narrate the ethical reasoning behind decisions. By communicating numbers as stories and sustainability as shared meaning, organizations can transform governance from a compliance mechanism into a communicative practice that nurtures legitimacy and public trust. Only when sustainability indicators become intelligible narratives—accessible, reflexive, and human—can the digital economy authentically align innovation with ecological and ethical responsibility.

2.4. Indicators as Communicative Devices

In the context of green governance, indicators are not merely measurement instruments but symbolic devices—a communicative language through which organizations express their identities, values, and moral positions. Each metric carries semiotic power: it not only quantifies performance but also constructs meaning. Signifiers in this sense become communicative signs—a bridge between data and publics, between facts and values. For instance, when Google announced that 100% of its global operations are powered by renewable energy (Google, 2024), the message extended far beyond a technical disclosure. It articulated a moral stance, projecting leadership and responsibility in the digital age. Every indicator, therefore, is performative: it does not merely describe a reality but actively produces it. For digital organizations, sustainability metrics are thus not neutral data—they are acts of communication that shape how the world perceives their legitimacy, ethics, and purpose.

The foremost indicator of green governance is legitimacy, which defines an organization's social and ecological credibility. In a post-pandemic world increasingly skeptical of corporate promises, legitimacy has become one of the most valuable forms of capital. When companies such as Patagonia or Interface demonstrate consistent, independently verified sustainability performance, the public perceives authenticity—not only through numbers but also through coherence between claims and conduct. Legitimacy arises not from compliance but from communicative authenticity—the alignment between language, evidence, and action (Christensen & Cornelissen, 2021). The second key indicator is transparency, which in the algorithmic era functions as a new form of justice. When Meta, for example, makes its emissions calculation methodology publicly auditable (Meta, 2024), it does more than reveal data; it reinterprets the very meaning of accountability. Such openness transforms indicators into platforms for dialogue, where the public evolves from passive consumers of information into active interpreters of organizational meaning.

Transparency becomes particularly significant in discussions of ethical artificial intelligence, where social and environmental impacts remain uncertain and often opaque. By disclosing methodologies and assumptions behind AI-driven processes, organizations foster a recursive loop of public accountability—strengthening both credibility and moral trust. The third dimension is engagement. Effective indicators not only report progress but stimulate participation, transforming measurement into a collaborative process. Google's *Sustainability Data Commons* initiative, which invites researchers and communities to collectively analyze environmental data, illustrates this transformation. Through such initiatives, data ceases to be proprietary and becomes a shared public resource—an instrument for collective intelligence and shared governance.

From a communicative governance standpoint, indicators are not static representations of performance but dialogic structures that enable social learning. Their communicative power lies in their ability to invite scrutiny, reinterpretation, and co-creation. A communicative indicator does not speak *about* progress but *with* its stakeholders—encouraging reflection, critique, and

contribution. The essence of communicative governance, therefore, is collaboration through conversation. Indicators that are inclusive and participatory move beyond showcasing ecological performance; they embody a collective desire to negotiate what sustainability truly means in practice. Ultimately, the challenge of digital sustainability lies not in counting carbon but in finding a language that bridges data and moral awareness. Indicators are only as meaningful as the narratives that accompany them. They do not speak for themselves—we give them voice through communication. When used with integrity, indicators can transform quantitative governance into ethical dialogue, bridging science and society. The future of sustainable digital governance will depend not merely on how well organizations measure their impact, but on how convincingly and humanely they communicate it—turning metrics into meaning and accountability into shared understanding.

2.5. Theoretical Framework: Communicative Green Governance Model

Proper and insightful green governance can only stand firm when it is embedded at the very core of communication. Communication should not be conducted in a ceremonial or decorative manner, but rather in a strategic, critical, and participatory way. The *Communicative Green Governance Model* proposed in this study aims to strengthen three foundational theories in strategic communication: strategic communication theory, stakeholder engagement theory, and legitimacy theory. First, strategic communication theory (Heath, 2018; Cornelissen, 2023) emphasizes that organizations do not merely communicate about policy; they derive meaning and social vitality through communication itself. Second, the stakeholder engagement approach (Freeman, 2010; Morsing & Schultz, 2021) posits that sustainable desire and shared purpose cannot be created in isolation but must emerge from ongoing dialogue with affected stakeholders. Third, legitimacy theory (Suchman, 1995) provides a moral and social framework, asserting that organizational actions are legitimate only to the extent that they are accepted by the broader public. Together, these perspectives affirm that governance is not a mechanism of control but a process of communication.

In this process, the choice of words is never incidental; it is essential to green governance—it constitutes its very lifeblood. Communication creates a continuum of meaning, validates interpretation, and reinforces acceptance within the public sphere. When Google announced that it had achieved 100% renewable energy operations (Google, 2024), the legitimacy of that achievement stemmed not solely from data but from its independent audit and public discussion. Legitimacy arises not from numbers, but from relational meaning. Thus, ESG indicators acquire significance only when connected to communicative processes that transform data into shared values. In other words, sustainability cannot be measured solely by quantifiable metrics; it must also be understood through its capacity to evoke ethical reflection and social reflection.

The *Communicative Green Governance Model* can be conceptualized as a layered ecosystem—dynamic in its data, narratives, and beliefs, continuously interacting across different domains. The first is the Structural Layer, which includes formal governance systems such as ESG policies, audit mechanisms, reporting protocols, and regulatory frameworks. This

constitutes the backbone of the organization, where performance is measured and managed. Yet, this layer remains incomplete without a communicative dimension. The second, the Communicative Layer, forms the core of the model—where organizations generate strategic messaging, craft narratives of shared purpose, and create dialogic spaces with stakeholders. In practice, this involves framing emission data within moral narratives that connect innovation with accountability. The third, the Legitimacy Layer, represents the social domain where all communication is tested. It is not a resting point but a public arena where perceptions, values, and beliefs are contested and cultivated, with trust as its primary currency.

This three-layer model can be illustrated through Unilever's sustainability strategy. Structurally, Unilever employs an ESG reporting system aligned with GRI and TCFD standards (Structural Layer). Communicatively, it narrates its sustainability agenda through the *Clean Future* campaign (Communicative Layer). Within the Legitimacy Layer, it invites shareholders and the public to openly evaluate its *Climate Transition Plan*. From this perspective, legitimacy is not imposed but co-created through ongoing social dialogue. Hence, green governance emerges as a dialogical and evolutionary process—one that replaces hierarchical judgment with participatory negotiation of meaning.

Communicative Green Governance is cyclical and reflective, rather than linear or static. The process begins with Measurement, wherein organizations collect and analyze ESG data through digital auditing and reporting systems. Yet this raw data lacks social meaning until it is interpreted and communicated. The Communication stage involves translating these measurements into transparent and participatory narratives that explain *why* actions matter—for instance, why a 10% emissions reduction signifies a moral and operational transformation, not merely a numerical outcome. The Legitimation stage follows, where communication is tested by public perception, media scrutiny, and stakeholder engagement. In theory, legitimacy cannot be self-proclaimed; it must be conferred by society. When Patagonia pledged its entire corporate fortune to environmental causes, it transformed ethical intention into lived legitimacy—demonstrating that authenticity emerges from consistent, verifiable action. Finally, the Transformation stage occurs when dialogue, critique, and reflection generate new policies, innovations, or practices, feeding back into a renewed cycle of communicative governance.

This cyclical process accelerates in today's hyperconnected digital environment, where every corporate statement is immediately interpreted, contested, and amplified in public discourse. Under these conditions, communication is no longer a subsidiary channel but the primary arena for constructing organizational presence. Thus, *Communicative Green Governance* is not merely an academic framework; it is a strategic survival mechanism for organizations navigating the complexities of digital transparency. True sustainability does not emerge from compliance or policy alone—it is born from an ongoing conversation among data, people, and meaning.

2.6 Key Terms and Definitions

Communicative Governance Indicators (CGI): A set of qualitative indicators—transparency, narrative coherence, dialogue, and ethical communication—is designed to assess not only environmental and social performance but also how such information is communicated meaningfully to the public.

Transparency: The openness and clarity of sustainability communication enable stakeholders to access, interpret, and evaluate environmental and social data from traceable, verifiable sources.

Narrative Coherence: The alignment between what organizations say and what they actually do regarding sustainability practices ensures consistency across messages, values, and actions.

Dialogue: A participatory communication process involving stakeholders in defining, implementing, and evaluating sustainability strategies, thereby creating procedural legitimacy through collaboration and mutual understanding.

Ethical Communication: A moral foundation of sustainability communication that requires honesty, accountability, and reflexivity in reporting both achievements and failures, thus reinforcing moral legitimacy.

Green Governance Indicators: Quantitative and qualitative metrics used to evaluate environmental performance—such as carbon emissions, energy efficiency, and e-waste management—within a broader ethical and communicative framework.

ESG (Environmental, Social, and Governance): A global framework for assessing corporate sustainability performance across environmental stewardship, social responsibility, and governance integrity dimensions.

Organizational Legitimacy: The perception that an organization's actions are desirable, proper, and appropriate within a socially constructed system of norms and values, sustained through credible and transparent communication.

Sustainability Communication: Strategic communication practices that convey an organization's environmental and social commitments, transforming technical data into narratives that build trust, engagement, and long-term accountability.

3. METHODOLOGY

This study adopts a qualitative multiple-case study design to examine how digital organizations construct, disclose, and communicate green governance indicators within the context of digital sustainability aspirations. The research follows five systematic stages, as outlined below:

Stage 1: Determination of the Unit of Analysis: Four major digital organizations—Google, GoTo Group, Grab, and Shopee—were selected as the primary units of analysis. The selection was guided by three main criteria: (1) the organization's industry influence and scale of operations, (2) the degree of transparency demonstrated in its annual and sustainability reports, and (3) the extent of its public communication related to environmental initiatives. These criteria ensured that each case represented diverse yet comparable approaches to sustainability communication within the digital ecosystem.

Stage 2: Data Collection: Primary data were collected from multiple corporate and public sources, including sustainability reports published between 2023 and 2025, official company websites, corporate press releases, and ESG digital dashboards presenting real-time sustainability metrics. To strengthen triangulation and enhance analytical depth, the study also incorporated secondary materials such as media coverage, stakeholder responses, and relevant regulatory documents associated with sustainability disclosures. This combination of data sources enabled both breadth and credibility in the empirical foundation of the study.

Stage 3: Critical Discourse Analysis (CDA): The first analytical phase employed Critical Discourse Analysis (CDA) to identify the ideological representations, rhetorical strategies, and implicit power relations embedded within corporate sustainability narratives. This method was used to interpret how language and discourse construct the symbolic meanings of environmental responsibility and shape the communicative legitimacy of digital organizations.

Stage 4: Framing Analysis: In the second analytical phase, Framing Analysis was applied to examine how each organization structured, emphasized, and contextualized environmental issues within its communication materials. This analysis revealed the interpretive frames through which organizations construct narratives of ecological stewardship and influence public perception, stakeholder engagement, and institutional legitimacy.

Stage 5: Integration and Interpretation of Findings: Finally, insights derived from CDA and Framing Analysis were integrated to synthesize a comprehensive interpretation of communicative structures in digital green governance. This integrative stage explored how communicative actions function not only as channels for information transmission but also as instruments of symbolic governance—shaping perceptions of accountability, transparency, and responsibility within the broader digital sustainability ecosystem.

4. RESULTS & DISCUSSION

4.1 The Power and Peril of Communicating Sustainability Indicators

Communication within the context of sustainability governance has become both one of the most strategic and the most fragile elements in establishing the legitimacy of digital organizations. As the business world shifts toward the digital realm, companies are no longer focused solely on reducing carbon emissions or improving energy efficiency; they are increasingly expected to

disclose their processes and outcomes transparently and credibly. Research by Edelman (2024) reveals that 71% of people worldwide now evaluate their trust in a brand based on its social and environmental impact rather than on product performance. In this sense, sustainability communication is no longer a supplementary activity but a core mechanism of governance—an interface that connects organizations with the moral expectations of the digital public.

The positive dimension of sustainability communication is evident in companies such as Google and Grab, which have succeeded in balancing quantitative data with narrative storytelling. For instance, Google employs real-time data visualizations to represent energy consumption and efficiency trends across its global data centers, enabling continuous performance assessment without the constraints of annual reporting cycles. This transparency builds public trust because openness becomes a governance principle rather than an image-management exercise. Similarly, Grab adopts an impact storytelling strategy that bridges the gap between ESG indicators and tangible human realities through the experiences of drivers and local communities. In both cases, communication transcends mere information transfer; it becomes an act of meaning-making that reinforces moral and social relationships between corporations and society.

However, this communicative power also has a darker dimension. Many organizations fall into greenwashing—the practice of symbolically exaggerating sustainability achievements without verifiable data. A notable example is Shopee, whose *Shopee Forest* program faced criticism from independent monitors for lacking scientific verification of its digital reforestation claims. Similar instances of deceptive communication have occurred globally, as seen in Volkswagen's (2015) emissions manipulation and H&M's (2022) false sustainability labeling. In the era of digital transparency, such practices are easily exposed, rendering corporate legitimacy increasingly fragile.

Beyond greenwashing, communication risks include data distortion and the aestheticization of sustainability. Data manipulation occurs when companies selectively present figures that favor profitability while downplaying larger environmental costs. Meanwhile, superficial sustainability arises when environmental responsibility is reduced to visual branding—green color palettes, leaf icons, or promotional campaigns devoid of policy substance. A *PwC* (2024) study found that only 37% of digital companies publicly disclose their carbon footprint, underscoring the gap between performative communication and genuine accountability.

To address these dilemmas, the principle of ethical disclosure becomes central. Organizations must learn to communicate unintended consequences and disclose not only successes but also shortcomings. Transparency includes revealing the limitations of available data, implementation barriers, and unanticipated impacts. For example, Microsoft (2023) openly reported a temporary 21% increase in carbon emissions from data center expansion for AI services, while transparently outlining its mitigation plans. Such honesty demonstrates that integrity in communication can strengthen legitimacy even in less favorable circumstances. Transparency, therefore, is not the pursuit of perfection but the practice of accountability.

Effective sustainability communication must also be dialogical rather than monological. It should invite public participation, recognize diverse perspectives, and define success collectively. The GoTo Group exemplifies this approach by engaging driver-partners and MSME communities in forums that openly discuss ESG targets and review the *GoGreener* program. Such participatory dialogue transforms communicative governance into a collaborative arena rather than a formal reporting ritual. Dialogue not only reinforces legitimacy but also reframes sustainability as a shared ethical endeavor rather than a corporate marketing objective.

Within the conceptual framework of *Communicative Green Governance*, this process follows a cyclical logic: measure → communicate → legitimize → transform. The cycle continues even after formal reporting, serving as a dynamic mechanism for organizational learning and structural adaptation. When companies measure their ecological impact, communicate findings transparently, and share them publicly, they strengthen not only their reputation but also the moral and social foundations of sustainability. If public trust is the ultimate currency, ethical and dialogical communication becomes a far more enduring investment than short-term image campaigns.

This discussion concludes that communication lies at the heart of green governance in the digital era. It is not an auxiliary function but a form of governance practice in its own right. In a world where data has become the language of power and transparency, the measure of integrity, organizations that balance technical precision with communicative honesty will emerge as leaders in shaping a more ethical, inclusive, and relational digital economy. Ultimately, the future of green governance will depend not only on reducing emissions but on cultivating shared truths through open, transparent, and humane communication.

4.1.1. Digital Ethics and Algorithmic Transparency

In the realm of digital sustainability communication, algorithms have become the new gatekeepers, determining how, when, and to what extent environmental information is presented to the public. Algorithms governing search engines, social media, and corporate dashboards do not operate neutrally; they function through selective processes of classification, prioritization, and personalization that are often invisible to users (Beer, 2017). For instance, when Google displays results for "carbon neutrality," the order of visibility reflects internal logics that integrate parameters of credibility, engagement, and commercial relevance. Consequently, sustainability communication is no longer purely discursive but also technological: algorithms serve as mediators that shape the visibility and legitimacy of environmental data. This introduces a new ethical paradox in which communicative responsibility lies not only with the organization but also with the technological architectures that structure meaning (Crawford, 2021).

Furthermore, algorithms can amplify *sustainability communication bias* through a process known as *algorithmic curation*, which filters content based on user behavior and engagement patterns. As O'Neil (2016) argues, algorithms optimized for attention often privilege emotionally appealing narratives over scientifically grounded information. In practice, this dynamic can

reinforce digital *greenwashing*, in which visually appealing "green" content circulates more widely than technically complex reports. Interactive ESG dashboards developed by companies such as Microsoft or Google, while promoting data accessibility, are also guided by algorithmic logic that determines which data are highlighted and how they are visualized. Therefore, the integrity of sustainability communication depends not only on the accuracy of its content but also on the ethical transparency of the algorithmic systems that structure it.

The concept of *algorithmic transparency* thus becomes central to the ethics of communicative governance. Transparency, in this context, extends beyond open disclosure of environmental data to include openness about how algorithms interpret, rank, and visualize such data (Diakopoulos, 2019). When digital organizations like Grab or Shopee deploy algorithmic systems to assess and communicate their sustainability impact, the parameters, datasets, and decision rules embedded in those systems should be subject to independent auditing. Without such oversight, algorithms risk becoming symbolic instruments for image management rather than empirical representation. Pasquale's (2015) notion of the *black box society* underscores this concern—closed algorithmic systems create an illusion of objectivity while concealing value-laden decisions within opaque code. Hence, algorithmic transparency should be recognized not merely as a technical obligation but as a moral imperative for digital sustainability governance.

From the perspective of *communicative governance*, algorithms act as communicative agents in meaning-making processes rather than as neutral data processors. Cooren (2018) emphasizes that communication can be "materialized" through non-human entities—including digital infrastructures and artificial intelligence—that co-construct organizational reality. When ESG dashboards display carbon emissions or recycling rates, the algorithm effectively "speaks" on behalf of the organization, representing both its epistemic and moral positions. Yet, this communicative power becomes ethically fragile when algorithms are treated as unquestioned authorities. To maintain governance grounded in human values, organizations must ensure that algorithmic communication adheres to principles of *explainability*, *accountability*, and *traceability* (Floridi & Cowls, 2021).

Ultimately, the age of digital sustainability demands a redefinition of communicative responsibility that encompasses both human and non-human actors. When sustainability data is mediated through algorithmic curation, ethical transparency becomes not only a corporate duty but a technological necessity. As Mittelstadt et al. (2016) argue, AI systems that influence social decision-making must satisfy criteria of *epistemic transparency*—clarity regarding how and why decisions are made. The future of communicative green governance, therefore, depends on organizations' capacity to embed digital ethics into the design of their systems, not merely into their messages. Genuine sustainability communication requires more than measuring ecological impact; it must also articulate how the very algorithms that transmit such information remain morally and socially accountable.

4.1.2. The Role of Digital Media Ecology in Sustainability Narratives

The rise of digital communication technologies has fundamentally altered the ecology through which sustainability narratives are produced, circulated, and interpreted. Drawing from media ecology theory, Postman (1985) argues that the "medium is the metaphor," meaning that each medium shapes not only how information is transmitted but how reality itself is perceived. In the context of sustainability, the migration from static annual reports to dynamic digital platforms—videos, dashboards, podcasts, and AI-driven assistants—redefines what it means to "communicate responsibly." A company's carbon disclosure, for example, presented as a short interactive animation, may evoke emotional engagement but simultaneously obscure methodological details. Hence, the form of media becomes as influential as the content itself: it constructs the communicative environment in which trust, legitimacy, and ethical meaning are negotiated.

The affordances of digital media—its interactivity, immediacy, and multimodality—expand the expressive capacity of sustainability communication while introducing new epistemic challenges. Whereas static PDF reports once dominated corporate communication, organizations such as Google and Microsoft now use real-time dashboards and data visualizations that enable users to dynamically explore environmental indicators. These affordances enable continuous engagement rather than one-time reporting, cultivating transparency as an ongoing relationship rather than an episodic ritual (Scolari, 2012). Yet, as McLuhan (1964) famously noted, "the medium is the message"; interactive dashboards not only display sustainability data but also signal technological competence and moral progressiveness. Consequently, digital media do not merely communicate sustainability—they actively shape its meaning by embedding ecological ethics within aesthetic and technological experiences.

However, the same affordances that enhance accessibility can also produce unintended effects of simplification and performativity. According to Pariser (2011), algorithmic personalization and selective exposure can create "filter bubbles," limiting public understanding to narratives that align with prior beliefs or brand preferences. In sustainability communication, this phenomenon occurs when users encounter curated content that highlights only positive environmental initiatives, while negative externalities remain hidden. Similarly, visually rich dashboards may privilege design aesthetics over interpretive depth, leading audiences to perceive "sustainability" as a brand performance rather than a systemic transformation. In this sense, the digital ecology of sustainability risks transforming ethical accountability into what Manovich (2020) describes as *data aesthetics*—a visual spectacle of responsibility that prioritizes engagement metrics over moral reflection.

The integration of AI chatbots and voice assistants into sustainability communication further exemplifies how media ecology reshapes narrative intimacy and interaction. Chatbots employed by companies such as Unilever and Grab to answer ESG-related questions introduce a new form of "conversational governance," in which the public interacts directly with algorithmic communicators. As Baym (2015) observes, these human–machine interfaces blur boundaries between information and relationship, fostering immediacy but also raising concerns about authenticity and control. When sustainability dialogue is mediated by automated agents, the message becomes performative, real-time, responsive, and adaptive, but potentially constrained by pre-programmed corporate narratives. Such technological mediation demands critical awareness: communication ethics must extend to the design of interactional interfaces, ensuring that accessibility does not come at the cost of transparency.

Ultimately, the digital ecology of communication redefines sustainability narratives—transforming reporting into continuous, data-driven storytelling. In this new communicative environment, sustainability is no longer a static statement of intent but an evolving discourse performed across media, metrics, and publics. As Bødker and Dourish (2006) argue, technologies both enable and constrain participation; thus, communicative legitimacy depends on recognizing media as co-authors of meaning rather than merely neutral channels. The ethical task for organizations, therefore, is to cultivate reflexive media ecologies—systems that acknowledge how technological design shapes environmental imagination. Sustainable communication in the digital age requires balancing aesthetic innovation with epistemic integrity, ensuring that visibility does not substitute for veracity.

4.1.3. Psychological and Behavioral Dimensions of Sustainability Communication

The psychological dimension of sustainability communication is rooted in how individuals process persuasive messages, evaluate credibility, and translate awareness into behavior. According to the Elaboration Likelihood Model (ELM), persuasion operates through two cognitive routes: the *central route*, which involves critical evaluation of arguments, and the peripheral route, which relies on emotional cues and surface-level signals (Petty & Cacioppo, 1986). In sustainability contexts, messages emphasizing scientific data and transparency appeal to the central route, while green imagery, slogans, and endorsements activate the peripheral route. However, digital communication environments—dominated by brevity, visuality, and algorithmic curation—tend to favor the peripheral route, often producing shallow engagement rather than deep understanding. Consequently, the success of sustainability campaigns depends not only on informational clarity but also on the balance between cognitive depth and emotional resonance in message framing (Kollmuss & Agyeman, 2002).

Beyond cognitive processing, moral framing significantly shapes public interpretation of sustainability messages. According to Moral Framing Theory, individuals respond more positively to messages that align with their moral foundations, such as care, fairness, or loyalty (Feinberg & Willer, 2013). For example, messages highlighting intergenerational responsibility ("protecting the planet for future generations") tend to elicit stronger moral engagement than purely technical disclosures of carbon metrics. This moral resonance transforms sustainability communication into a narrative of shared values rather than a presentation of data. However, moral framing also entails risk: when moral appeals are overused or perceived as manipulative, they can backfire—triggering skepticism and accusations of virtue signaling (Winterich et al., 2019). Thus, effective communicative governance requires ethical calibration between persuasion and authenticity, ensuring that moral engagement does not become moral fatigue.

A growing challenge in sustainability communication is *sustainability fatigue*—a psychological condition characterized by desensitization to repetitive "green" messaging. Research by Delmas and Burbano (2011) and Goodman (2021) shows that audiences frequently exposed to idealized environmental claims may develop cognitive saturation, leading to declining attention and trust. In the digital sphere, where sustainability messages proliferate across social media, dashboards, and advertisements, repetition can paradoxically reduce credibility. The more organizations declare their environmental virtue, the more audiences suspect exaggeration. This phenomenon erodes what Heath (2018) terms "communicative legitimacy"—the perception that corporate speech corresponds to genuine ethical action. Repetitive sustainability messaging can therefore lead to communicative fatigue, eroding trust even when data accuracy remains high.

Behavioral responses to sustainability messages are further influenced by affective and social mechanisms. Studies in behavioral economics suggest that individuals are more likely to adopt pro-environmental behavior when messages emphasize immediate, tangible benefits rather than abstract global consequences (Thøgersen & Crompton, 2009). Social proof also plays a powerful role—when peers or influencers visibly adopt green practices, others tend to follow, driven by a desire for social alignment rather than environmental conviction (Cialdini, 2007). This underscores the importance of designing sustainability communication as a socially contagious process that integrates emotional motivation with behavioral modeling. Nevertheless, overreliance on behavioral nudges without substantive engagement risks producing symbolic conformity rather than lasting ethical transformation. Communicative governance, therefore, must prioritize informed participation over mere behavioral compliance.

Ultimately, the psychological and behavioral dimensions of sustainability communication reveal that trust is both a cognitive and affective construct—earned through consistent transparency, moral coherence, and dialogic reciprocity. When organizations neglect these psychological dynamics, sustainability communication becomes vulnerable to saturation, skepticism, and disengagement. The task ahead is not merely to disseminate more data but to cultivate psychological spaces of meaning where audiences can internalize sustainability as a shared moral and practical endeavor. As Petty and Cacioppo (1986) emphasize, enduring persuasion arises from elaboration—the reflective process through which individuals integrate information into personal belief systems. In the age of communicative governance, sustainability thus requires not only technological innovation but psychological integrity—a form of communication that informs, engages, and restores trust in equal measure.

4.1.4. Comparative Cultural Perspectives in Communicative Governance

The communicative governance of sustainability is not a culturally neutral process; it is embedded in distinct social norms, value systems, and communicative traditions that shape how legitimacy is constructed and maintained. Western models of sustainability communication—rooted in individualism, transparency, and adversarial accountability—often differ from Asian paradigms that emphasize collectivism, relational harmony, and moral responsibility (Hofstede, 2001; Hall, 1976). For example, while European companies highlight data disclosure and third-party verification to demonstrate transparency, many Southeast Asian organizations, such as GoTo or Grab, rely on community engagement narratives grounded in local cultural concepts like *gotong royong* (mutual cooperation). These differing approaches reveal that communicative legitimacy is not defined solely by data openness, but also by the degree of social resonance and moral reciprocity embedded in the communication process.

From a cross-cultural communication perspective, high-context cultures—common in Asia—tend to prioritize implicit meanings, relationship-building, and emotional tone over explicit verbal information (Hall, 1976). Consequently, sustainability reports in these contexts often emphasize stories, collective achievements, and social harmony rather than the quantification of performance metrics. This contrasts with low-context, data-driven Western communication, where clarity and disclosure serve as markers of accountability. As Chen and Starosta (2005) argue, intercultural communication competence requires sensitivity to both explicit and tacit modes of meaning-making. Therefore, when sustainability narratives are globally disseminated, communicative governance must bridge these cultural differences to prevent misinterpretations that could undermine legitimacy and trust.

Cultural orientations also shape stakeholder expectations regarding corporate responsibility and public dialogue. In collectivist societies, sustainability is frequently understood as a communal ethic rather than an individual or corporate virtue (Kim & Sharkey, 1995). Publics in Indonesia, Thailand, or Malaysia may perceive corporate humility, long-term community involvement, and indirect persuasion as more credible than assertive self-promotion. This aligns with Ting-Toomey's (1999) *face-negotiation theory*, which emphasizes that maintaining social harmony and preserving face are central to communicative legitimacy in Asian settings. Accordingly, communicative governance in these contexts should emphasize empathy, relational dialogue, and participatory inclusion rather than the direct confrontation or self-assertion common in Western ESG discourses.

However, as globalization and digitalization converge, hybrid communication models are emerging. Southeast Asian corporations increasingly adopt Western ESG reporting standards (such as GRI or SASB) while integrating culturally rooted practices of relational communication. Grab's "Kisah Hijau" and Shopee's community-based sustainability campaigns exemplify this hybridization—merging global transparency norms with local storytelling traditions that appeal to emotion and social solidarity. As Robertson (1995) describes through the concept of *glocalization*, global frameworks are reinterpreted through local cultural logics, creating adaptive governance structures that resonate within diverse moral ecologies. This synthesis enhances legitimacy by situating sustainability communication within both global accountability systems and local moral frameworks.

Ultimately, comparative cultural analysis reveals that communicative governance cannot be reduced to a universal formula of transparency, disclosure, or participation. Legitimacy is a culturally negotiated construct that reflects differing moral economies of communication. In Western societies, truth and disclosure form the basis of ethical credibility; in many Asian societies, relational trust and moral sincerity perform that function. Therefore, effective sustainability communication requires *intercultural reflexivity*—an awareness that communicative governance is shaped by both the content of messages and the cultural scripts through which meaning is understood. As Hofstede (2001) reminds us, sustainable governance depends on recognizing diversity not as an obstacle, but as a communicative asset capable of enriching global ethical dialogue.

4.1.5. Crisis Communication and Reputation Recovery in Sustainability Failures

Sustainability communication inevitably encounters crises—moments when the credibility of an organization's environmental claims is challenged or disconfirmed. In such situations,

communicative governance becomes a crucial mechanism for restoring legitimacy and trust. As Coombs (2007) explains through *Situational Crisis Communication Theory* (SCCT), stakeholders evaluate organizational responses based on perceived responsibility and the quality of corrective communication. When sustainability claims are revealed to be overstated or misleading—as in the Volkswagen Dieselgate scandal or Shopee's contested digital reforestation initiative—mere technical corrections are insufficient. What restores legitimacy is communicative transparency: the willingness to acknowledge errors, disclose limitations, and articulate learning processes (Coombs & Holladay, 2012). A crisis thus tests not only an organization's operational resilience but its communicative ethics—the extent to which it can transform failure into moral accountability.

The process of reputation recovery following a sustainability failure involves reframing the organization's narrative from denial to reflexivity. Benoit's (1995) *Image Restoration Theory* identifies strategies such as mortification (admitting fault), corrective action (showing change), and bolstering (reminding audiences of prior goodwill) as key to repairing damaged legitimacy. Yet in sustainability contexts, these strategies require adaptation toward greater dialogic openness and participatory learning. Microsoft's acknowledgment of increased emissions during its AI data center expansion exemplifies this shift from defensive justification to transparent reflection. By publishing mitigation plans and inviting public scrutiny, the company reframed its crisis communication as a learning opportunity—transforming reputational risk into institutional credibility. In communicative governance, therefore, the ethical handling of failure becomes as important as success; legitimacy is sustained not through perfection but through honest accountability.

Moreover, sustainability crises unfold within highly networked digital environments where information spreads virally and public interpretation is shaped by social media dynamics. As Schultz, Utz, and Göritz (2011) demonstrate, digital platforms amplify the outcomes of crisis communication—both positive and negative—depending on perceived responsiveness and authenticity. Rapid, defensive messaging may be interpreted as evasive, while transparent, dialogic engagement fosters forgiveness and trust recovery. The interactive nature of digital media thus demands that organizations view sustainability crises not merely as disruptions but as communicative events requiring participatory dialogue. When the public can witness ongoing corrective action and moral reflection in real time, organizational legitimacy becomes performative and reconstructive, rather than declarative.

An equally important aspect of post-crisis sustainability communication lies in narrative coherence. As Christensen, Morsing, and Cheney (2020) note, credibility is achieved when

organizational discourse maintains consistency across time, platforms, and audiences. Inconsistency—between words and deeds, or between crisis acknowledgment and subsequent behavior—intensifies skepticism and prolongs reputational damage. For Southeast Asian corporations navigating early stages of ESG adoption, this coherence is particularly critical. Grab and GoTo, for instance, have faced scrutiny regarding the alignment between sustainability narratives and the labor realities of gig-economy workers. Addressing such contradictions requires more than reputational repair—it necessitates institutional reform that reconnects communication with structural change. In communicative governance, consistency is not rhetorical continuity but ethical coherence between discourse and practice.

Ultimately, crisis communication in sustainability governance represents an opportunity for organizational renewal. As Heath (2018) argues, crises can serve as moral turning points that reveal deeper structural flaws and prompt systemic learning. Effective post-crisis communication, therefore, integrates three key elements: transparency (disclosing the nature and scope of the failure), responsibility (acknowledging moral accountability), and transformation (demonstrating policy and behavioral change). When managed within these ethical parameters, communicative governance evolves beyond damage control toward moral reconstruction. The future of sustainable legitimacy will depend not on avoiding crises but on engaging them communicatively—transforming public scrutiny into participatory dialogue and corporate redemption.

4.1.6. Data Ethics and the Quantification Paradox

The pursuit of sustainability in digital governance often rests upon the assumption that what can be measured can be managed. Yet this managerial logic conceals a profound paradox: the quantification of sustainability, while essential for accountability, can also obscure the moral and relational dimensions of environmental responsibility. As Merry (2016) argues, the global proliferation of indicators, indices, and benchmarks reflects a "seduction of quantification," in which numerical representations are mistaken for ethical truth. ESG dashboards and carbon metrics provide the illusion of precision, but they cannot fully capture the complexities of ecological interdependence, social justice, or cultural diversity. When sustainability becomes synonymous with data visualization, organizations risk reducing moral responsibility to numerical performance—transforming governance into a technocratic exercise of counting rather than caring.

This quantification paradox is particularly salient in the age of big data, where algorithmic systems translate environmental performance into metrics optimized for comparability and

investor appeal. Porter (1995) notes that quantification, while intended to enhance objectivity, often functions as a social technology of trust, legitimizing authority through the appearance of neutrality. In digital sustainability contexts, this dynamic manifests when organizations publish extensive datasets to demonstrate transparency, even as the interpretive frameworks behind those numbers remain opaque. The act of measurement itself becomes a form of discourse—a way of performing accountability rather than enacting it. As Espeland and Stevens (2008) emphasize, numbers do not merely describe reality; they actively shape it, producing what they call the "commensuration" of values—the transformation of moral and ecological concerns into standardized, comparable data points.

The ethical dilemma lies in the potential depoliticization of sustainability when it is framed exclusively through quantitative indicators. While data enable comparability and monitoring, they may also suppress normative debates about what constitutes justice, responsibility, or sufficiency. In practice, organizations may prioritize measurable outcomes (such as emission reductions) over less quantifiable goals (such as community empowerment or ethical reflection). This tendency reflects what Power (1997) calls the *audit society*—a governance culture obsessed with verification, where legitimacy is equated with documentation rather than meaning. In sustainability communication, the challenge is to ensure that numbers remain anchored in narrative contexts that preserve ethical intentionality. Otherwise, digital transparency becomes a simulation of accountability: visible, traceable, but morally hollow.

Emerging discussions on *data ethics* offer an avenue to reconcile measurement with meaning. Floridi (2013) defines data ethics as the moral evaluation of data practices in relation to human flourishing and environmental integrity. Within communicative governance, this entails designing ESG systems that make explicit not only what is measured but why and for whom. For example, Microsoft's Carbon Call initiative invites collaborative verification of emission data to prevent interpretive bias—a step toward what Kitchin (2021) terms *reflexive data governance*, where the social implications of measurement are continuously interrogated. By embedding reflexivity into data systems, organizations can transform metrics into sites of dialogue rather than control—where numbers serve as communicative bridges between science, policy, and public ethics.

Ultimately, the quantification paradox underscores that sustainability cannot be reduced to datafication without losing its moral essence. Ethical communication requires integrating quantitative rigor with qualitative reflection, transforming measurement from a bureaucratic requirement into a shared moral inquiry. The future of communicative green governance will depend on organizations' ability to humanize data—to narrate what the numbers mean, not

merely what they show. As Merry (2016) reminds us, indicators should function as "ethical technologies," tools for conversation rather than domination. When organizations move beyond counting toward understanding, sustainability regains its ethical depth, and digital governance becomes not a system of metrics, but a practice of meaning.

4.2 Towards Communicative Governance Indicators: Integrating Metrics with Meanings

Efforts to integrate quantitative metrics with communicative meaning mark a new phase in digital green governance. Over the past two decades, global organizations have developed measurement systems based on ESG indicators—such as carbon emissions, energy efficiency, social diversity, and ethical governance. However, recent research (UNEP, 2024; PwC, 2024) reveals that more than 60% of global ESG reports fail to present poverty and social equity data in ways accessible to non-technical audiences. As a result, these reports often become technocratic tools that lack communicative power and social resonance. In response, this chapter proposes the *Communicative Governance Indicators (CGI)* framework—a multidimensional model designed not only to measure environmental and social impact but also to evaluate how organizations communicate these impacts honestly, clearly, and dialogically.

Transparency: The first dimension of the CGI framework refers to the clarity, openness, and accessibility of sustainability data. It encompasses the public's ability to interpret, compare, and critically assess information. For instance, the *Google Sustainability Dashboard* allows users to track carbon emissions and renewable energy usage in real time. Through such mechanisms, communication evolves from a static reporting exercise into an interactive data ecosystem that fosters trust through traceability. In best practice, transparency extends beyond rhetorical openness; it transforms communication into a shared responsibility, shifting the process from one-way disclosure to collaborative engagement.

Narrative Consistency: The second dimension emphasizes alignment between an organization's communicated messages and its actual values and actions. This coherence represents a key aspect of legitimacy in sustainability communication, as the public has become increasingly sensitive to discrepancies between corporate promises and behavior. According to Edelman (2024), up to 72% of digital audiences disengage from brands perceived as hypocritical in environmental matters. Patagonia exemplifies narrative consistency by embedding its "planet over profit" philosophy across its entire business model—from material recycling initiatives to allocating profits for conservation. In Southeast Asia, GoTo Group has similarly sought to align its *GoGreener* program with internal policies and messaging, building long-term credibility beyond short-term campaign cycles.

Dialogue: The third dimension highlights stakeholder participation in defining, implementing, and evaluating sustainability indicators. Dialogic communication enables the co-creation of meaning and promotes participatory governance. A strong example is Microsoft's *Climate Innovation Fund*, which collaborates with universities, NGOs, and local communities to design carbon-neutral projects. This approach strengthens *procedural legitimacy*—legitimacy derived not from outcomes alone but from inclusive, deliberative processes. Within digital ecosystems, dialogue can be facilitated through open ESG forums or participatory platforms that invite public input into sustainability policies, fostering a sense of shared ownership and transparency.

Communication Ethics: The fourth dimension serves as the moral foundation of the CGI framework, encompassing honesty, accountability, and responsibility in communicating both successes and shortcomings. Organizations frequently fall into the "winning paradigm," highlighting achievements while concealing challenges. Yet, genuine credibility is achieved when failures are openly acknowledged. For instance, Unilever (2023) disclosed that 23% of its sustainable packaging targets had not been met and provided an explanatory analysis along with corrective measures. Such transparency reflects *moral legitimacy*—trust rooted in integrity and ethical reflection. In academic contexts, communication ethics serves as a critical lens for distinguishing substantive, transformative communication from manipulative or performative discourse.

Together, these four dimensions—transparency, narrative consistency, dialogue, and communication ethics—synergistically form a communicative governance ecosystem. Implementing the CGI framework enables digital organizations to evaluate not only *what* they communicate but also *how* and *why*. In this view, indicators of intent evolve from static numbers into lived narratives that connect data with human values. The CGI framework thus bridges the gap between governance as measurement and governance as meaning-making, positioning communication not as an adjunct to reporting but as a central instrument for cultivating trust, legitimacy, and social transformation in the digital age.

The Communicative Governance Indicators (CGIs) framework represents a paradigm shift from instrumental reporting toward meaning-centered governance. Yet, its practical realization demands a deeper interrogation of how metrics can embody ethical, relational, and epistemic values within digital ecosystems. As Power (1997) argues, the proliferation of measurement in modern institutions often leads to an "audit culture," where symbolic compliance eclipses genuine accountability. Within sustainability communication, this risk is amplified when ESG metrics are presented as detached facts rather than as communicative constructs grounded in

moral purpose. To counter this, CGIs must be understood not merely as evaluative tools but as *moral mediators*—structures that translate data into shared ethical meaning. By situating measurement within communicative ethics, organizations transform accountability from a bureaucratic obligation into a dialogical act of moral transparency (Christensen, Morsing, & Cheney, 2020).

A critical challenge in integrating metrics with meanings lies in what scholars call *interpretive opacity*—the gap between what indicators measure and what stakeholders understand them to mean. As Espeland and Stevens (2008) explain, quantification inherently simplifies complex realities by "commensurating" distinct values into comparable numerical forms. This process, while facilitating governance, risks erasing contextual nuances essential to social legitimacy. In sustainability communication, such abstraction may alienate publics who seek ethical clarity rather than statistical sophistication. Consequently, communicative indicators must be designed to retain interpretive depth—connecting numbers with narratives, data with dialogue. The transition from *data transparency* to *semantic transparency* requires that organizations disclose not only the metrics themselves but also the reasoning, assumptions, and moral choices embedded in their construction (Floridi, 2013).

Moreover, the strength of the CGI model lies in its potential to transform sustainability from a managerial exercise into a co-created communicative process. Traditional ESG frameworks often privilege institutional authority, relegating stakeholders to passive audiences. By contrast, participatory approaches to communicative governance—rooted in theories of deliberative democracy (Dryzek, 2010) and stakeholder engagement (Morsing & Schultz, 2021)—invite publics to define what should be measured, why, and how meaning should be interpreted. This participatory ethos reframes legitimacy as a shared achievement rather than a corporate asset. In practice, co-creation of indicators allows marginalized voices—such as local communities, employees, or non-governmental actors—to contribute to the moral architecture of governance. Such pluralistic dialogue transforms measurement into a democratic act of interpretation, aligning organizational accountability with collective ethical reasoning.

The digitalization of governance introduces both opportunities and risks for this integrative process. Advanced analytics, AI-driven dashboards, and real-time data platforms enable unprecedented transparency and traceability, yet they also raise concerns about algorithmic bias and semantic distortion. As Diakopoulos (2019) notes, automated communication systems interpret and visualize data according to embedded values and design assumptions, thereby shaping how publics perceive legitimacy. Within a communicative governance framework, technological mediation becomes an ethical issue: if AI selectively curates sustainability

information, it risks reproducing new forms of greenwashing under the guise of data objectivity. Therefore, digital communicative systems must incorporate principles of *algorithmic explainability* and *traceable transparency*, ensuring that every digital interface functions not only as a reporting device but as a moral artifact—a site where ethics and epistemology converge (Crawford, 2021).

Ultimately, integrating metrics with meanings requires a philosophical reorientation of what governance itself entails. Communicative governance is not merely about optimizing indicators; it is about reconstituting the relationship between knowledge, responsibility, and trust. As Habermas (1984) theorized, communicative rationality replaces instrumental control with mutual understanding—the foundation of democratic legitimacy. Applying this lens to sustainability implies that data must serve deliberation, not domination. The CGI framework thus embodies an ethical synthesis between measurement and meaning: transparency becomes dialogic, consistency becomes reflexive, and ethics becomes performative. Only through such communicative integration can sustainability transcend its managerial confines to become an ongoing, participatory, and morally accountable conversation between organizations and society.

Operationalizing the Communicative Governance Indicators (CGIs) requires a multidimensional understanding of how sustainability communication is embedded within organizational infrastructures and cultural contexts. In practice, integrating communicative indicators into digital governance systems demands alignment between *technical infrastructures* (data management and visualization tools) and *ethical architectures* (values and accountability mechanisms). As Orlikowski and Scott (2016) suggest, technologies are not neutral tools but "sociomaterial configurations" that shape how organizations perceive and perform responsibility. Consequently, the CGI framework must account for how communicative intent translates into design logic—how dashboards, reporting platforms, and AI-driven systems mediate transparency and engagement. Without such reflexivity, communicative governance risks being absorbed into managerial routines, reducing ethics to procedural compliance rather than dialogic practice.

The challenge of institutionalizing communicative indicators also lies in overcoming the fragmentation of sustainability reporting standards. Despite the global proliferation of ESG frameworks such as GRI, SASB, and TCFD, few explicitly assess the *communicative quality* of disclosures—the clarity, accessibility, and interpretive openness of sustainability narratives. According to Adams (2020), current reporting regimes emphasize financial materiality over social intelligibility, perpetuating a technocratic discourse that marginalizes public interpretation. The CGI framework, by contrast, advocates for *interpretive governance*: a process in which data presentation is evaluated not only for accuracy but also for communicative resonance across

diverse audiences. This requires developing new evaluation metrics—such as *communicative coherence indexes* or *dialogic engagement scores*—that measure how effectively organizations translate data into shared understanding and moral dialogue.

A further dimension concerns the epistemological status of indicators themselves: how organizations construct "truth" through data. As Porter (1995) and Latour (2005) note, indicators are not reflections of reality but performative artifacts that stabilize institutional credibility through quantification. Within communicative governance, this performativity must be made explicit rather than concealed. Indicators do not merely inform—they persuade, justify, and legitimize. Recognizing their rhetorical power enables organizations to reframe sustainability reporting as a site of meaning negotiation rather than as a matter of factual finality. The CGI framework, therefore, invites a post-positivist rethinking of knowledge in governance: sustainability is not an objective state to be measured but a relational process to be communicated, contested, and co-created.

Another key trajectory in developing CGIs lies in embedding *reflexivity* and *learning loops* within communicative systems. According to Argyris and Schön's (1996) concept of *double-loop learning*, organizations mature ethically when they not only correct errors within existing frameworks but also question the assumptions underlying those frameworks. Applied to sustainability communication, this means that communicative indicators should function as *learning devices*—mechanisms that trigger reflection on whether the very metrics used remain ethically adequate. For instance, if carbon reduction indicators neglect social equity dimensions, the CGI framework would prompt organizations to expand their definitions of performance to include distributive justice and participatory governance. In this way, communication becomes both evaluative and transformative—a recursive process that continuously reshapes the meaning of sustainability itself.

Finally, the long-term evolution of the CGI framework depends on its capacity to bridge institutional accountability with societal imagination. As Beck (1999) observes in his theory of reflexive modernization, contemporary governance must confront the unintended consequences of its own progress. Communicative governance thus serves not only to measure sustainability but to democratize its imagination—to engage citizens, researchers, and policymakers in co-authoring visions of ecological and digital futures. In this sense, CGIs are not endpoints of measurement but beginnings of dialogue. Their ultimate success will not be determined by the quantity of indicators but by the quality of relationships they sustain—relationships grounded in transparency, humility, and collective responsibility. The integration of metrics and meanings,

therefore, marks a turning point in sustainability discourse: a move from calculative rationality to communicative wisdom, where governance is redefined as the ethics of shared understanding.

4.3 Policy and Practice Recommendations

Building communicative green governance requires not only a conceptual paradigm shift but also the implementation of concrete policy strategies and practices. Within digital organizations, regulatory bodies, and academic institutions, this urgency has become increasingly evident, as the communication of sustainability goals now constitutes a central arena for public legitimacy—one that determines long-term trust and organizational reputation. This chapter proposes three strategic directions for digital organizations, regulators, and scholars as collective steps toward the *Era of Communicative Governance*—an era in which data are not merely reported but actively processed, interpreted, and debated in open public spaces.

For digital organizations, the foremost priority is to develop sustainability dashboards that serve not only as reporting mechanisms but also as interactive, participatory communication platforms. Such dashboards should dynamically visualize ESG indicators and be accessible to diverse stakeholders. Exemplary cases include the *Google Sustainability Explorer* and *Microsoft Cloud for Sustainability*, which enable users to track real-time carbon impacts while contextualizing the social implications behind the data. This communicative model can serve as a blueprint for Southeast Asian companies such as Grab and Shopee, which continue to rely on static, text-based PDF sustainability reports that lack interactivity and dialogue. By adopting interactive dashboards, organizations can open new avenues for public collaboration—engaging communities, investors, and policymakers in providing feedback on sustainability initiatives. In doing so, digital governance transitions from the mere dissemination of data to the democratization of information.

For regulators, an essential step is establishing explicit communication standards for ESG reporting. Existing frameworks such as GRI and SASB primarily emphasize quantitative performance indicators, often neglecting the qualitative dimensions of how data are communicated. New regulatory standards should incorporate parameters such as clarity, accessibility, responsiveness, and dialogic transparency in the communication of sustainability information. For example, the *European Sustainability Reporting Standards (ESRS, 2024)* require large EU-based companies to assess not only environmental performance but also the effectiveness and openness of their ESG communication strategies. This model could be adapted within the ASEAN region to ensure consistency and comparability of sustainability communication practices. Establishing such standards will enhance public accountability, reduce the risk of greenwashing, and reinforce the social legitimacy of digital enterprises in global governance ecosystems.

For scholars, this momentum presents a critical opportunity to expand the boundaries of communication research within governance and sustainability studies. Communication scholarship must evolve beyond traditional message or media analysis toward systemic

inquiry—examining how communication structures influence governance processes, public trust, and institutional legitimacy. An interdisciplinary integration of communication, digital technology, and business ethics would enrich the theoretical foundation of communicative governance, making it more relevant and actionable in the digital age. Researchers might explore how ESG narratives are constructed, negotiated, and sustained in online spaces, as well as the role of non-corporate actors—such as environmental influencers, NGOs, and data journalists—in shaping perceptions of legitimacy. Universities in Southeast Asia, in particular, could spearhead regional frameworks for goal-oriented sustainability communication that reflect local cultural values such as *gotong royong* (mutual cooperation), equality, and social responsibility.

This set of recommendations underscores a key assertion: communication is not an accessory to green governance, but its infrastructure. Organizations that embed communication within the design, implementation, and evaluation of sustainability policies will gain a significant legitimacy advantage. Regulators who establish standardized frameworks for communicative ESG reporting will foster transparency and ethical coherence. Scholars who investigate the communicative dimensions of governance will contribute the theoretical and critical depth necessary to transform intention into authentic, participatory practice. Ultimately, the future of digital green governance will depend not only on how we measure sustainability but also on how we communicate it—honestly, inclusively, and responsibly.

5. CONCLUSIONS

Digital transformation has placed humanity at a crossroads—between technological progress and ecological responsibility. While digitalization fosters efficiency, innovation, and global connectivity, it simultaneously amplifies carbon emissions, e-waste, and digital inequality. Within this paradox, the concept of Communicative Green Governance (CGG) emerges as a framework that bridges data and meaning, linking sustainability metrics to ethical and participatory communication. Through the Communicative Governance Indicators (CGIs)—transparency, narrative coherence, dialogue, and communication ethics—this study highlights that effective sustainability governance depends not only on what is measured, but on how it is communicated.

A comparative analysis of Google, GoTo, Grab, and Shopee illustrates this dynamic. Google and Microsoft demonstrate traceable transparency through interactive dashboards that invite public engagement. GoTo and Grab, meanwhile, foster local legitimacy through social storytelling that connects ESG indicators with human experiences. In contrast, Shopee's sustainability communication remains largely aesthetic—symbolic but lacking ethical and operational depth—reflecting the persistent tension between image and substance in Southeast Asian corporate practices. Theoretically, this article advances governance theory toward a communicative turn, framing communication not as a tool of policy delivery, but as the very process through which legitimacy and accountability are socially constructed. By integrating insights from legitimacy theory, stakeholder engagement, and strategic communication, CGG redefines governance as an ongoing dialogue among organizations, regulators, and the public.

6. RECOMMENDATIONS

In practice, the study recommends that organizations design participatory sustainability dashboards, that regulators establish communication standards for ESG disclosure, and that academics expand research on the relationship between discourse, legitimacy, and sustainability. Ultimately, the future of digital sustainability will be determined not by technological sophistication but by the honesty, transparency, and ethical reflection embedded in communication. Ethical communication thus becomes not merely a tool of legitimacy but the moral foundation of sustainable governance.

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