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How are Sustainability Disclosures by Smart Cities, Symbolic or Substantive?

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Abstract

Purpose: This study aims to understand the themes of sustainability disclosure by smart cities in Indonesia through the lens of legitimacy theory.

Method: We analyzed 199 sustainability disclosure narratives and visuals from 24 smart cities in Indonesia using content analysis. Meanwhile, legitimacy theory was used as an analytical tool to identify substantive and symbolic disclosures.

Findings: Sustainability disclosures by smart cities are dominated by reports on environmental programs and commitments. Meanwhile, sustainability disclosures are mostly substantive (69%) rather than symbolic (31%).

Originality/Value: This study provides new insights into sustainability disclosure in the context of smart cities in Indonesia, using textual and visual sources and the lens of legitimacy theory.

Keywords: Smart City; Sustainability Disclosure; Legitimacy.
Paper Type: Research Paper.

1. Introduction

Climate change has become a global issue, driving increasing demands for transparency and accountability in environmental management by governments worldwide. The public now expects governments to provide more transparent information on policies, programs, and the environmental impacts of development activities. With advances in digital technology, public communication channels, such as government websites, are being used to publish information demonstrating a commitment to sustainability and responsible governance (Herdiyanti et al., 2019). In this context, sustainability disclosure is not merely administrative reporting, but also an accountability mechanism that determines the level of public trust in government.

In Indonesia, the digital transformation of government is progressing through the Movement Towards 100 Smart Cities program, which encourages local governments to integrate technology into public service processes, city management, and information provision. The Smart City website is a key innovation, serving as a direct communication medium between the government and the public. In addition to providing basic information services, this platform can also serve as a sustainability accounting instrument, namely a tool for presenting environmental policy footprints, carbon emissions data, clean energy initiatives, and environmental program achievements (Kementerian Komunikasi dan Digital, 2022). Thus, Smart City is not just a technology project, but a space of ecological accountability supported by digital information systems.

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Despite the growing development of digital infrastructure, the quality of sustainability disclosure by local governments remains uneven. Some regions only provide general, normative information, such as environmentally friendly vision statements or green slogans, without supporting quantitative data, performance indicators, or program explanations. Others display photos of activities without sufficient context, rendering the information more symbolic than substantive. Conversely, a small number of regions have begun to provide evidence of concrete programs such as integrated waste management, air quality monitoring, and renewable energy use. This wide variation demonstrates that the quality of digital environmental accountability in Indonesia remains inconsistent and unstandardized (Mahesa et al., 2019).

Research on sustainability disclosure in Indonesia has so far been predominantly conducted in the private sector, focusing on sustainability reports, annual reports, and corporate social media. Conversely, studies specifically examining how local governments use Smart City websites to communicate about sustainability remain very limited. Furthermore, the symbolic substantive representation analysis approach is commonly used in accounting research (Cho et al., 2015; Mahayani, 2024).

Globally, various countries have demonstrated success in mitigating the impacts of climate change by implementing smart cities. Singapore, Japan, and the United States are examples of countries that have successfully adopted advanced technologies to improve energy efficiency and reduce their carbon footprint in urban areas. Smart grids, electric vehicles, and the use of renewable energy are key elements of their strategies to create more environmentally friendly cities (Hu et al., 2023). Several studies in developed countries (Kaur & Lodhia, 2019; Cohen & Karatzimas, 2022; Aleksandrov et al., 2022) have shown that government digital platforms and smart city initiatives have the potential to improve environmental accountability, but in practice, they are often used as symbolic communication tools with limited data support. Furthermore, studies that systematically distinguish between the depth of substantive and symbolic representation in local government digital disclosure remain limited.

From the perspective of legitimacy theory, environmental disclosure is understood as the government's effort to gain and maintain social acceptance by aligning policies and actions with public values (Suchman, 1995; Deegan, 2002). The sustainability accounting literature shows that such disclosures often exist in tension between substantive and symbolic representation (Boiral, 2013; Cho et al., 2015; Chelli et al., 2019). The novelty of this research lies in analyzing sustainability disclosures (textual and visual) on the Smart City websites of district/city governments in Indonesia. Furthermore, Legitimacy theory is used to identify substantive and symbolic representations of smart cities' sustainability disclosures on official websites. Therefore, this study asks two main questions:

RQ1: How are smart cities in Indonesia disclosing sustainability through textual and visual narratives on official websites?

RQ2: How are the representations of smart cities' sustainability disclosures in Indonesia—substantive or symbolic?

This study contributes theoretically by enriching the public sector sustainability accounting literature through an analysis of climate change information disclosure on Smart City platforms from a legitimacy theory perspective (Suchman, 1995; Deegan, 2002; Boiral, 2013). This research provides new insights into how local governments construct environmental legitimacy through substantive and symbolic representations in digital disclosure (Chelli et al., 2019). In practice, these findings confirm that online environmental disclosures do not always reflect actual performance but also serve as a government image-building strategy.

2. Literature Review

2.1. Smart City

A smart city is developing as an urban development governance approach that utilizes digital technology to improve the efficiency of public services and urban resource management (Angelidou, 2014). In the context of sustainability, smart cities are used by local governments to support environmental management, including emissions monitoring, energy efficiency, sustainable transportation, and climate change adaptation policies (Aleksandrov et al., 2022). Therefore, smart cities are not merely technological projects, but also a means of managing and communicating sustainability performance.

Sustainability accounting literature indicates that climate change is an integral part of sustainability disclosure, particularly in the environmental dimension. Climate change disclosure includes information on carbon emissions, mitigation and adaptation policies, energy use, and long-term environmental risks (Bebbington & Unerman, 2018; Brunelli et al., 2020). Therefore, climate change disclosure in smart city platforms can be understood as a specific form of local government sustainability disclosure.

Several international studies have found that government websites and smart city platforms are used as media for sustainability disclosure, but the quality and depth of the information presented vary. Kaur and Lodhia (2019) showed that local government digital disclosures tend to be narrative. Cohen and Karatzimas (2022) found that many smart cities emphasize policy branding over the disclosure of measurable environmental performance data. These findings indicate that climate change disclosures in smart cities often do not fully reflect substantive sustainability practices.

In the Indonesian context, smart city research still focuses on technological readiness and digital governance, while studies that specifically integrate climate change disclosures into sustainability disclosures within smart city platforms remain limited. Therefore, this study differs from prior literature by systematically analyzing how climate change information is disclosed in local government sustainability disclosures on smart city websites.

2.2. Public Sector Sustainability Reporting

The public sector plays a strategic role in climate change mitigation and adaptation through policy formulation, resource management, and the provision of public services. Therefore, local governments are required to disclose climate change information transparently as a form of public accountability (Bebbington & Gray, 2001). Public sector climate change reports generally include information on greenhouse gas emissions, environmental policies, emission reduction programs, and climate risk adaptation efforts.

Previous research indicates that public sector climate change disclosure remains diverse and unstandardized. Research by Brunelli et al. (2020) found that most local governments disclose climate commitments narratively without clear performance indicators. Other research indicates that public sector climate change reports are often influenced by political pressures, institutional capacity, and stakeholder expectations, so the quality of disclosure does not always reflect actual environmental performance (Ogilvy et al., 2022).

With the advancement of digital technology, climate change reports are no longer presented solely in formal reports but are also presented online through media such as government websites and smart city platforms. Research by Aleksandrov et al. (2022) shows that digital media expands the reach of climate communication but also creates

space for information simplification and policy symbolization. This indicates that digital climate change disclosures require critical analysis to assess their depth and substance.
In the Indonesian context, studies on climate change reporting by local governments remain limited and focus primarily on policy or institutional readiness. Research specifically analyzing climate change disclosures on smart city websites as part of local government sustainability disclosures remains limited. Therefore, this study contributes by examining how district/city governments in Indonesia disclose sustainability information through smart city platforms and the characteristics of these disclosures.

2.3. Legitimacy Theory and Sustainability Accounting

Legitimacy theory explains that organizations, including local governments, seek to gain social acceptance by demonstrating that their actions align with societal values, norms, and expectations (Suchman, 1995). In the public-sector context, legitimacy is not only related to bureaucratic effectiveness but also to transparency, accountability, and the government's ability to demonstrate its commitment to strategic public issues, such as climate change and environmental sustainability. In disclosure practices, governments can employ two legitimacy strategies: substantive representation and symbolic representation. Substantive representation refers to concrete actions supported by strong evidence, such as carbon emissions data, air quality indicators, environmental audit reports, or detailed explanations of mitigation and adaptation programs (Boiral, 2013). This substance reflects verifiable performance and demonstrates the government's ability to account for the use of public resources.

In contrast, symbolic representation uses normative narratives, decorative visuals, slogans, or claims of commitment without clear data or methodological support (Pachauri et al., 2014; Cho, 2019). This strategy helps maintain the institutional image, especially when environmental capacity or data infrastructure is still limited. In the context of local governments in the digital era, these two forms of legitimacy are evident on Smart City websites. Digital technology enables the provision of real-time environmental data, emissions dashboards, report publication, and sensor-based information systems. However, the same platforms can also be used merely as a showcase, presenting a visual representation of a smart city without verifiable environmental information (Cohen & Karatzimas, 2022). Therefore, examining substantive and symbolic representations is crucial to assessing the extent to which Smart Cities truly enhance environmental accountability or simply serve as an image-building tool.

3. Research Method

3.1. Research Approach

This study uses a qualitative approach, employing content analysis, to examine the city government's disclosure of climate change information on its smart city website. Content analysis was chosen because of its advantages in examining organizational communication documents and artifacts, including reports, policy narratives, and digital content such as websites (Krippendorff, 2013). In this study, the analysis aimed to identify, interpret, and classify the meanings conveyed by disclosures presented narratively and visually in official government digital media. Content analysis allows researchers to understand communication patterns, information focus, and environmental representation tendencies displayed by the city government.

3.2. Data

The research data consisted of 199 narratives obtained from 24 district/city Smart City websites listed in the Ministry of Public Works and Housing's Smart City Masterplan. The units of analysis in this study were textual and visual narratives, operationalized as stand-alone information units on smart city websites, either as a single article, a web page, or a specific content section with a main theme related to environmental issues. Data collection was carried out through several systematic stages. First, the researcher identified and selected 24 districts/cities that were members of the Ministry of Public Works and Housing's 100 Smart City Movement program in its initial phase, based on the criteria of actively implementing the smart city concept and having publicly accessible sustainability information. Next, the researcher searched 70 official local government websites, including smart city portals, main government sites, and relevant external sources. Content related to climate change, carbon emissions, and environmental programs was then documented as 7 PDF documents, 11 visual data, and 188 textual data. The number of analysis units per region varied (minimum 7, maximum 10) to maintain the completeness of the information representation. All data is classified and archived by disclosure category as the basis for the analysis process.

The data analysis in this study employed an interpretive qualitative content analysis approach to uncover hidden meanings, patterns, and themes within official city government documents. Myers (2013) emphasized that in interpretive research, data analysis involves not only summarizing document content but also interpreting the data within its surrounding social, cultural, and institutional context. Therefore, researchers will examine not only explicit content but also the symbolic meanings of the narratives, visuals, and documents comprising the research data. This approach allows researchers to explore the dimensions of communication and representation constructed by the city government in the context of disclosing carbon emissions as a form of public sector accountability.

The data analysis technique used was content analysis in smart city government sustainability disclosures. Kress and Leeuwen (2020) argues that meaning is generally communicated not only through language but also through visual features. For example, exploring the objects used in an image and how they are placed within the caption or sentence. This study employed a qualitative content analysis model by Krippendorff (2013) to examine secondary data in the form of texts and documents available on the smart city website.

The initial stage of the analysis was conducted by applying open coding, which involves identifying pieces of data, either text or visuals, relevant to environmental and sustainability issues. All data were collected from public documents and digital content on official city government websites that met the selection criteria (Krippendorff, 2013). In this process, researchers used coding guidelines developed by integrating several standard frameworks, namely GRI 305: Emissions, the CDP Cities Framework, and ICLEI references. The five main categories are presented in Table 1.

Tabel 1. Coding Guidance

Code	categories	Indicators	Quality of disclosures
EC	Environmental Commitment	Green vision and mission statement, environmental policy roadmap, emission reduction targets.	Symbolic/Substantive
MT	Management Transparency	Published emission data, sustainability indicators, and climate change action plans.	Symbolic/Substantive

Tabel 1. Coding Guidance (Continued)

Code	categories	Indicators	Quality of disclosures
EP	Environmental Programs	Electric vehicle implementation, waste management, urban greening.	Symbolic/Substantive
PE	Public Participation and Education	Digital campaigns, public consultations, community engagement.	Symbolic/Substantive
SR	Symbols Representing Responsibility	Smart environment logo, net-zero icon, environmental performance infographics.	Symbolic/Substantive

Source(s): Authors' Own Work

After identifying the main themes, the next stage is selective coding, which involves classifying each data unit into two forms of representation: symbolic and substantive. This classification is based on the legitimacy theory approach, as explained by Chelli et al. (2019), which states that organizations can build public legitimacy through both concrete actions and representative symbols. Symbolic representation refers to a form of disclosure that is declarative, relying on rhetoric or imagery, without demonstrating concrete actions or impacts (Chelli et al., 2019). Examples include the use of "eco-friendly" visuals, net-zero icons, or visual displays that do not explain specific actions.

Substantive representation demonstrates real engagement through policy implementation, environmental action, or the publication of verifiable data, such as carbon emissions reports, climate action documents, or waste management program documentation. These two stages are conducted separately but complement each other, to build a comprehensive understanding of the content and meaning of sustainability disclosures delivered by city governments in digital media. This strategy allows researchers not only to describe content but also to interpret the motives, messages, and legitimacy strategies used in the context of smart cities in Indonesia (Chelli et al., 2019).

To ensure the consistency and reliability of the analysis, a validation process was conducted using intercoder checking. Twenty percent of the data analysis units were coded independently by two coders, then compared and discussed to reach agreement on the interpretation of categories and classification of representations. The kappa test results were 0.89. This was done to maintain conceptual reliability and enhance the credibility of the findings. Furthermore, researchers periodically rechecked the coding results and systematically documented the analysis process in the audit trail. This way, the entire decision-making process during coding could be traced and scientifically accounted for (Krippendorff, 2013).

4. Results and Discussion

4.1. Sustainability Disclosures: Environmental Programs and Commitments

This study uses secondary data obtained from the official smart city websites of local governments in Indonesia. These sites serve as a public communication medium for the movement towards 100 smart cities, a national initiative coordinated by the Ministry of Communication and Informatics (Kominfo) and the Ministry of Public Works and Public Housing (PUPR). In addition to these main sites, researchers explored external links and supporting pages directly connected to the Smart City portal, such as the official websites of city/district governments, environmental agencies, and government news

platforms (PPID, Diskominfo, or Regional Environmental Agency), as well as credible city/district news platforms. This program aims to encourage the integration of information technology in city governance, public services, and sustainable development (Kementerian PUPR, 2023). In the context of this study, the Smart City website is seen as a digital accountability medium for local governments, through which they convey their commitment to the environment and sustainability.

Based on the official Smart City Masterplan document published by the Ministry of Public Works and Public Housing in 2023, 24 regencies and cities were selected as sources of research data, considering that they already had active and publicly accessible Smart City websites, content reflecting environmental activities and initiatives, and were registered as part of the national Smart City pilot project. Analysis of 199 narratives from the 24 district/city governments revealed that sustainability disclosures on the Smart City platforms were diverse, uneven, and tended to focus on specific types of information. Most local governments published narratives on the achievements of their Environmental Programs and Environmental Commitments, particularly in waste management, green open spaces, renewable energy, environmental campaigns, and regional emission-reduction plans.

Of the total data, the Environmental Program category demonstrates concrete actions by local governments in environmental management and sustainable development. Programs such as electric bus procurement, community-based waste management, green city parks, water conservation, and renewable energy utilization were the dominant narratives in this category. Data in this category represented the most significant findings, accounting for 74 of the 199 analysis units. The second category, Environmental Commitment, describes the extent to which local governments demonstrate intent, commitment, and strategic policy direction in realizing sustainable development. The narratives in this category are declarative and normative, generally taking the form of visions, missions, statements by regional heads, and policy documents published on websites. Data in this category comprises 38 citations from a total of 199 units of analysis.

The third category, Management Transparency, contains narratives demonstrating local governments' openness in managing environmental information, including performance data, policies, and program achievements. These disclosures are typically made through digital dashboards, infographics, public reports, or regular publications on the Smart City website. Transparency is a crucial indicator of local government's public accountability. Of the 199 units of analysis, 31 quotes relate to environmental transparency. The fourth category, Public Participation and Education, encompasses 24 units of analysis demonstrating how local governments build social collaboration and community participation in sustainability programs. Narratives in this category encompass outreach activities, environmental education, digital campaigns, and community involvement in maintaining cleanliness and conservation. The final category, Symbolic Representation, encompasses 27 of the 199 units of analysis, reflecting the use of visual elements, slogans, or digital symbols that reinforce the region's image as a smart and environmentally conscious city. Narratives in this category emphasize not only the content of the message but also the method of delivery. Local governments use visual icons, logos, and infographics to foster positive perceptions and strengthen the Smart City identity.

The next stage of analysis was conducted to classify each narrative unit into two forms of representation: substantive and symbolic, based on the content of the message communicated by the local government through the Smart City website. This classification aims to assess the extent to which disclosures represent real actions

(substantive) or are merely symbolic or rhetorical communication. Of the 199 narrative units collected from 24 cities and regencies, 133 disclosure excerpts were classified as substantive, while 66 were symbolic. This pattern indicates that, in general, sustainability disclosures on Smart City websites in Indonesia have been oriented towards evidence of real activities. However, symbolic elements are still used to strengthen the public image and digital communication of local governments.

Tabel 2. Examples of Sustainability Disclosures by Smart Cities

No	Smart cities	Visual and texts disclosures
1	Bandung Regency	
2	Sleman Regency	
3	Sukabumi Regency	Sukabumi Regent H. Marwan Hamami, along with regional heads from 49 cities and regencies across Indonesia, signed a memorandum of understanding on the Smart City Movement Program. (Environmental Commitment - Symbolic).
4	Tangerang Citiy	The Head of the Tangerang City Environmental Agency, Tihar Sopian, stated that since the outreach program was implemented in 2019, Tangerang City has established 412 climate villages (RW) in 104 sub-districts. They have also received national recognition. (Real-Substantive Environmental Program).
5	South Tangerang City	The evaluation score for the Electronic-Based Government System (SPBE) in South Tangerang City (Tangsel) increased from 3.18 in 2023 to 3.48 in 2024, as stipulated in the Decree of the Minister of Administration and Bureaucratic Reform of the Republic of Indonesia Number 663 of 2024. (Management Transparency - Substantial).
6	Tomohon City	The Head of the Tomohon City Environmental Agency, Jhon Kapoh SS MSi, stated that the breakthrough in utilizing organic waste to produce environmentally friendly fertilizers and enzymes has made Tomohon a

smart city. (Environmental Program - Substantive).

Source (s): Authors' Own Work

4.2. Representation of Sustainability Disclosures: Substantive Vs. Symbolic

The research findings indicate that Smart City websites have become the primary medium for local government sustainability communication, but the pattern and depth of disclosures vary across regions. The findings indicate that local government sustainability disclosures are generally organized into five main categories, with Environmental Programs and Environmental Commitments dominating. This indicates that local governments tend to highlight policy activities and commitments as evidence of their concern for climate change issues. However, these disclosures are often presented narratively and are not yet fully standardized, particularly in how performance indicators and quantitative data are presented.

From a legitimacy theory perspective, this pattern reflects local governments' efforts to build normative and pragmatic legitimacy by demonstrating alignment between policy values and public expectations for sustainable development (Suchman, 1995; Deegan, 2002). This finding aligns with previous studies in the public sector, which show that sustainability disclosures often serve as a means of policy communication rather than as an instrument for reporting measurable environmental performance (Kaur & Lodhia, 2019; Brunelli et al., 2020).

The majority of sustainability disclosures fall into the substantive category, particularly in the Environmental Program and Management Transparency categories, characterized by a link between the web narrative and the programs outlined in regional budget documents. This representation reflects a performance-based legitimacy strategy, in which local governments seek to gain public trust by demonstrating verifiable actions and achievements.

Conversely, symbolic representations are still found, particularly in the Symbols of Representation and some Environmental Commitments categories, demonstrated through slogans, icons, and general narratives without supporting data or performance indicators. Within the framework of legitimacy theory, these practices reflect symbolic legitimacy strategies used to maintain an image of environmental concern amidst limited reporting capacity (Cho et al., 2013; Chelli et al., 2019). This finding is consistent with the literature identifying symbolic disclosure in organizational sustainability reporting in both the private and public sectors (Boiral, 2013; Adams & Abhayawansa, 2022).

Theoretically, this study extends the application of legitimacy theory to public-sector digital sustainability reporting, specifically through Smart City platforms. Unlike previous studies that focused on formal sustainability reports or organizational annual reports (Cho et al., 2015; Michelon et al., 2015), this study's findings demonstrate that legitimacy is now also constructed through dynamic online narratives, visuals, and data. Thus, Smart Cities can be understood as a new arena for digital legitimacy reporting practices in public sector sustainability accounting.

Based on the triangulation of 2022 regional budget (APBD) documents from 24 regencies/cities, 18 regions (75%) have program allocations relevant to environmental and sustainability issues, consistent with the substantive disclosure patterns on the Smart City website. Four regions (17%) exhibit a tentative pattern, while two regions (8%) have no environmental programs in their APBDs, consistent with symbolic disclosures on the website. These findings suggest that substantive disclosures are generally supported by fiscal commitments, whereas symbolic disclosures are often not supported by budgets and may reflect digital decoupling or greenwashing. In general, substantive tendencies

emerged most frequently in the Management Transparency and Environmental Program categories. At the same time, symbolic dominance in Environmental Commitment and Representational Symbols indicated that environmental issues were still often positioned as image strategies. These results confirm the dualism of representation between substance and symbol in climate change disclosure practices on Smart City platforms in Indonesia.

5. Conclusion

This study analyzed 199 sustainability disclosure narratives from Smart City and external websites across 24 districts/cities in Indonesia. The results show that Environmental Programs and Environmental Commitments dominate disclosures. Sixty-nine percent of the narratives are substantive, and 31% symbolic. However, substantive disclosures still focus on program performance activities and do not refer to measurable sustainability indicators. Furthermore, there are regional differences, reflecting variations in digital capacity and readiness for environmental accountability.

The results of this study have important theoretical implications for the development of legitimacy theory in the context of public-sector sustainability disclosure. The dominance of substantive representations in local government narratives confirms that digital media, particularly Smart City websites, are a strategic means of building legitimacy grounded in data and action, rather than solely through normative claims. These findings reinforce the notion (Suchman, 1995; Deegan, 2002) that the legitimacy of public organizations is now also mediated by the digital space, where transparency and accountability are increasingly demanded. This research also aligns with findings (Mahayani, 2024), which show that local governments tend to build legitimacy through a combination of symbolic compliance and substantive actions in public reporting, even though digital platforms offer more open and difficult-to-control dynamics. Thus, this research broadens the theoretical horizon by positioning Smart Cities as a new arena for the study of environmental legitimacy.

Implications for the literature: this research enriches the study of smart cities and sustainability accounting in the public sector, particularly in the Indonesian context, which has received limited international research attention. The research findings support previous research (Hasibuan & Sulaiman, 2019; Mahayani, 2024), which asserted that local governments are still in the early stages of integrating sustainability principles into digital reporting systems. Furthermore, this study extends the discussion raised by scholars regarding the shift from a technocratic to a human-centric approach (Aleksandrov et al., 2022; Cohen & Karatzimas, 2022). However, it found that, in practice, environmental information disclosure still tends to be procedural and does not open space for deliberation, as emphasized by the dialogic accounting approach. Thus, this study provides a new empirical contribution by mapping how environmental legitimacy is constructed through digital representations on smart city platforms.

For practical purposes, this study shows that smart city/district governments have not fully utilized smart city websites to provide substantive accountability on climate change issues. City governments need to improve the quality of disclosure by including more measurable indicators, displaying emissions data and program achievements, and involving the public in the planning and evaluation process, as recommended by the OECD (2020). The findings also indicate that more digitally advanced cities tend only to display general information, necessitating a push to balance symbolic representation with

data-driven reporting. Thus, this study encourages local governments to implement the principles of transparency, participation, and openness in accordance with the dialogue-based smart city agenda.

Regarding policy implications, the study results emphasize the need to develop national guidelines for the disclosure of climate change information on local government digital platforms. The central government, through relevant ministries, can develop minimum standards for environmental reporting on smart city websites to ensure more consistent and comparable information quality across districts/cities. Furthermore, policies need to ensure that smart city digital transformation is oriented not only toward technology but also toward public value, as recommended by the human-centric smart city literature (Aleksandrov et al., 2022; Cohen & Karatzimas, 2022). This policy is crucial for preventing symbolic reporting practices and encouraging the implementation of dialogic governance, including the involvement of citizens and civil society organizations in the development of environmental content on city websites.

This study has several limitations that should be considered when interpreting the results. First, not all smart city governments in Indonesia have active, accessible Smart City websites or dedicated menus on the environment and sustainability. This situation has led researchers to expand their data coverage by accessing external websites related to smart cities. This has led to the disclosure of sustainability through other channels, such as institutional performance reports.

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