

## Smart City Sustainability Disclosure: Local Government Digital Legitimacy in Indonesia

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**Abstract:** *Digital transformation has encouraged city governments in Indonesia to adopt the concept of smart cities as an effort to improve public services while strengthening accountability for sustainability. Smart city websites now serve not only as a medium for information, but also as an instrument of legitimacy for local governments to demonstrate their environmental responsibility. This study aims to analyze patterns of environmental sustainability disclosure on smart city websites in Indonesia through a thematic approach covering five main categories: environmental commitment, management transparency, real environmental programs, public participation and education, and symbols of representation. This study uses a qualitative approach with content analysis methods. Data were collected from 24 district-level smart city websites. Cities included in the first phase of the national program "Movement Towards 100 Smart Cities". The analysis results show that the most dominant disclosures are in the categories of environmental commitment and real programs, while transparency and public participation are still limited. These findings indicate that local governments use websites as a means of non-financial reporting to build public legitimacy through sustainability narratives. From an accounting perspective, this pattern confirms the function of digital sustainability disclosure as a form of environmental accountability and institutional legitimacy in the era of digital governance.*

**Keywords:** *Public Sector Accounting; Sustainability Disclosure; Digital Legitimacy; Environmental Accountability*

**Abstrak:** *Transformasi digital mendorong pemerintah kota di Indonesia mengadopsi konsep smart city sebagai upaya meningkatkan layanan publik sekaligus memperkuat akuntabilitas keberlanjutan. Situs web smart city kini berfungsi tidak hanya sebagai media informasi, tetapi juga sebagai instrumen legitimasi bagi pemerintah daerah untuk menampilkan tanggung jawab lingkungan. Penelitian ini bertujuan menganalisis pola pengungkapan keberlanjutan lingkungan pada situs web smart city di Indonesia melalui pendekatan tematik yang mencakup lima kategori utama: komitmen lingkungan, transparansi pengelolaan, program riil lingkungan, partisipasi dan edukasi publik, serta simbol representasi. Penelitian ini menggunakan pendekatan kualitatif dengan metode analisis isi. Data dikumpulkan dari 24 situs web kota pintar tingkat distrik/ kota yang termasuk dalam program nasional "Gerakan Menuju 100 Kota Pintar" tahap pertama. Hasil analisis menunjukkan bahwa pengungkapan paling dominan terdapat pada kategori komitmen lingkungan dan program riil, sedangkan transparansi dan partisipasi publik masih terbatas. Temuan ini menunjukkan bahwa pemerintah daerah menggunakan situs web sebagai sarana pelaporan non-keuangan untuk membangun legitimasi publik melalui narasi keberlanjutan. Dalam perspektif akuntansi,*

*pola tersebut menegaskan fungsi digital sustainability disclosure sebagai bentuk akuntabilitas lingkungan dan legitimasi institusional di era tata kelola digital.*

**Kata kunci:** Akuntansi Sektor Publik; Pengungkapan Keberlanjutan; Legitimasi Digital; Akuntabilitas Lingkungan

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**INTRODUCTION**

The growing demand for transparency and sustainability is driving local governments to expand their accountability practices beyond financial reports to non-financial disclosures that represent environmental commitments and performance. In the context of the transformation toward a smart city, official local government websites have become a strategic channel for communicating sustainability narratives to the public (Sulistyaningsih et al. , 2023 ; Cohen & Karatzimas, 2022) . However, the literature shows that public sector disclosures are often declarative and symbolic, with an emphasis on normative commitments rather than measurable performance indicators (Vilosa & Yuadi, 2024). This raises questions about whether disclosures on smart city websites reflect substantive environmental accountability or merely serve as instruments of digital legitimacy. Therefore, a thematic analysis is needed to understand the construction patterns of local government sustainability disclosures in the digital space.

According to the theory of legitimacy, every entity, both public and private, makes an effort to align behavior and communication with norms and mark social norms, which applies. Along with increasing societal expectations regarding environmental issues, organizations respond by strengthening their sustainability narratives through various forms of disclosure (Alsaid, 2021). At the city government level, this strategy is realized through various digital channels, including smart city websites, which represent a commitment to environmental issues, energy efficiency, and public participation in sustainable development (Gupta, 2019). Previous studies have shown that sustainability disclosure in the public sector tends to evolve in line with the dynamics of corporate communication, but with an orientation toward accountability and policy transparency (Farneti & Guthrie, 2009). International research has also found that digital disclosures by governments are often dominated by general narratives about environmental commitments, while aspects of management and public engagement remain less prominent (Rodríguez et al., 2020 ; Burritt & Schaltegger, 2010). This cause question about as far as where government area in Indonesia Articulating sustainability issues thematically through smart city websites as a form of digital legitimacy. Based on this gap, this study focuses on answering the question: "How are environmental sustainability disclosure patterns on smart city websites of city governments in Indonesia presented symbolically or substantively? "

Sustainability issues have become a global concern, demanding public institutions improve environmental transparency and accountability (Hasibuan &

Sulaiman, 2019). In the public sector context, these demands have driven the expansion of reporting practices from traditional financial reports to non-financial disclosures that represent government environmental commitments and performance (Alfayerds & Setiawan, 2021). Digital transformation through smart city initiatives has further expanded this communication space, with official local government websites serving as the primary channel for conveying sustainability narratives to the public. Several previous studies have shown that government sustainability disclosures tend to be declaratory and symbolic, with an emphasis on commitment rhetoric rather than measurable performance indicators (Made & Mahayani, 2024). However, previous research by Bahriansyah & Ginting (2022) generally focused on formal sustainability reports or policy documents and was limited in its analysis of the symbolic dimensions and visual representations in digital media as a form of legitimacy. Furthermore, few studies have operationalized legitimacy theory to explain how local governments construct digital legitimacy through the thematic structure of disclosures on smart city websites. This theoretical and methodological gap prompted this study to analyze the patterns of environmental sustainability disclosures on the websites of local governments in Indonesia using a content analysis approach grounded in legitimacy theory.

## **LITERATURE REVIEW**

### **Smart City and Climate Change**

Climate change is a global challenge that demands the active involvement of local governments in managing emissions, energy use, and urban environmental sustainability. Cities, as centers of economic and social activity, contribute significantly to carbon emissions, so urban policies need to integrate climate change mitigation and adaptation strategies (Vilosa & Yuadi, 2024). In this context, the smart city concept has evolved as an approach that combines digital technology, data-driven governance, and public participation to improve the efficiency of city management while supporting sustainable development (Alsaid, 2021 ; Mahesa et al., 2019).

Smart city implementation is not only related to the digitalization of public services, but also to the development of environmental policies such as energy management, sustainable transportation, and technology-based waste management (Made & Mahayani, 2024). Furthermore, digital platforms within the smart city ecosystem, such as official local government websites, also function as public communication channels to convey environmental programs and policies to the public. From a public sector accounting perspective, the delivery of this information can be understood as a form of non-financial disclosure that represents the local government's environmental responsibility in responding to climate change issues (Alsaid, 2021).

### **Sustainability Disclosure in Public Sector Accounting Perspective**

Sustainability disclosure is conceptually closely linked to the function of accounting reporting as an accountability mechanism. In the public sector context, sustainability disclosure not only reflects environmental and social performance but also serves as an instrument for government legitimacy and public trust (Ladista et al., 2023). According to organizational reporting theory, non-financial information disclosed through digital media extends government accountability beyond financial

reporting to multidimensional reporting (extended accountability) (Cohen & Karatzimas, 2022).

Through web-based disclosure, the government can convey narratives about environmental commitments, transparency in management, real programs, and community participation. However, the literature shows that in the sector, the public still faces challenges in terms of substance and consistency. Guthrie et al., (2010) found that local government sustainability reports often highlight a general narrative without measurable performance indicators. Similar results were also shown by Dozan Alfayerds & Setiawan (2021) that digital sustainability disclosures tend to be symbolic if not accompanied by empirical evidence of policy achievements (Chelli et al., 2019). In this context, research on disclosure themes on smart city websites is important because it can indicate which dimensions of environmental accountability are most emphasized by local governments. The five thematic categories resulting from the initial coding are commitment environment, transparency management, program environment real, public participation and education, and symbolic. These representations reflect the spectrum of non-financial accounting communications governments use to strengthen their public legitimacy.

### **Legitimacy Theory in Substantive and Symbolic Perspectives**

Legitimacy theory explains that organizations seek to gain and maintain social acceptance by demonstrating that their activities align with societal values and expectations (Suchman, 1995 ; Deegan, 2019). In the context of sustainability disclosure, the accounting literature distinguishes two main approaches to legitimacy strategies: substantive legitimacy and symbolic legitimacy.

Substantive legitimacy refers to an organization's efforts to demonstrate real, verifiable changes in practice and performance. In the public sector context, substantive legitimacy is reflected through the disclosure of concrete environmental programs, the provision of performance data, and the transparency of policy implementation that can be empirically assessed. This type of disclosure emphasizes evidence of policy actions and impacts on society (Chelli et al., 2019). In contrast, symbolic legitimacy focuses on constructing public image and perception through narratives, rhetoric, and visual representations that present the organization as a socially and environmentally responsible entity. This strategy is not always followed by substantive changes in organizational practices, but serves to build the impression of alignment with evolving social norms. In the context of local government digital communications, symbolic legitimacy is often manifested through sustainability slogans, commitment narratives, and the use of visual symbols that emphasize the identity of a "green city" or "smart city" (Chelli et al., 2019 ; Al-Mari & Mardini, 2024). Based on this distinction, this study uses the substantive and symbolic legitimacy perspectives as an analytical framework to understand the sustainability disclosure patterns on local government smart city websites. This approach allows for analysis not only of the existence of information, but also of how that information constructs representations of environmental responsibility in digital spaces.

## **RESEARCH METHOD**

### **Research Approach and Design**

This study uses a qualitative approach with a content analysis method (Krippendorff, 2013). The qualitative approach was chosen because this study is oriented towards understanding the meaning, interpretation, and representation of the sustainability narrative presented by the city government on the smart city website. Coding was carried out deductively based on the operationalization of legitimacy theory in two main categories, namely substantive legitimacy and symbolic legitimacy. Substantive legitimacy is identified through content that demonstrates the real actions of local governments, such as environmental programs, operational policies, activity reports, and the presentation of performance indicators or verifiable data. Symbolic legitimacy is identified through content that emphasizes commitment narratives, sustainable development visions, environmental slogans, or the use of visual symbols that represent images of sustainability without measurable evidence of performance. Each content unit is classified into the category that best represents the dominant meaning displayed in the disclosure (Myers, 2013).

### **Data Sources and Analysis Units**

The research data sources come from 24 regencies/cities in Indonesia, part of the first phase of the “Movement Towards 100 Smart Cities” program, coordinated by the Ministry of Public Works and Public Housing and the Ministry of Communication and Information Technology. Direktorat Jenderal Aplikasi Informatika, (2022) The selection of 24 regions was based on active participation in the national smart city program and the availability of digital pages that display environmental, social, and governance content. The units of analysis in this study include two main categories: textual and visual content. Textual content includes articles, news, activity reports, official publications, and various descriptions of environmental programs published on smart city websites. Meanwhile, visual content includes infographics, photos, icons, posters, and videos that convey sustainability messages. Both types of content were analyzed to explore how city governments represent environmental issues and climate change in their digital platforms. These two types of content were analyzed as forms of non-financial accounting disclosure, which describe the extent to which local governments display environmental accountability in their digital communications (Manes-Rossi, F., 2018).

### **Data Collection Techniques**

Research data was collected through a systematic web-based documentation process. The first stage began with identifying the smart city website addresses in each sample area. After that, researchers searched the site for content related to sustainability, climate change, and environmental issues. All data, both text and visual, was then downloaded and neatly documented in Excel spreadsheets to facilitate further organization and retrieval. In the final stage, researchers compiled thematic notes for each narrative and visual content deemed relevant to environmental issues, enabling the analysis to proceed in a more focused and in-depth manner. Each piece of data was assigned an initial code based on the regional source and publication date to ensure an audit trail during the analysis (Myers, 2013).

### **Data Analysis Techniques**

The analysis was conducted through two main stages of coding, with a focus on the first stage of coding (thematic) as the core of this study:

#### **Stage 1: Coding (Theme Exploration)**

At this stage, all narratives and visual content were analyzed using open coding techniques to identify the main themes in sustainability disclosure. The coding process resulted in five thematic categories, namely: Environmental Commitment (KL), which includes the disclosure of the vision, policies, and commitments of local governments to environmental issues; Management Transparency (MT), which contains information on environmental systems, data, or performance indicators; Real Environmental Programs (REP), which are narratives that showcase concrete activities such as waste management, renewable energy, or carbon emission reduction efforts; Public Participation and Education (PPE), which shows community involvement, environmental campaigns, and public education; and Symbols of Representation (SR), which are visual or narrative elements that depict an environmentally friendly image, such as logos, slogans, or green icons. This coding process then produces a theme frequency matrix for each region, which is then analyzed narratively to identify patterns of expression that emerge across regions.

#### **Stage 2: Narrative and Interpretive Analysis**

The coding results were then analyzed using a legitimacy-based disclosure analysis approach to interpret how these themes were used by local governments in building public legitimacy through digital communication (Deegan, 2019).

#### **Stage 3: Coding Reliability**

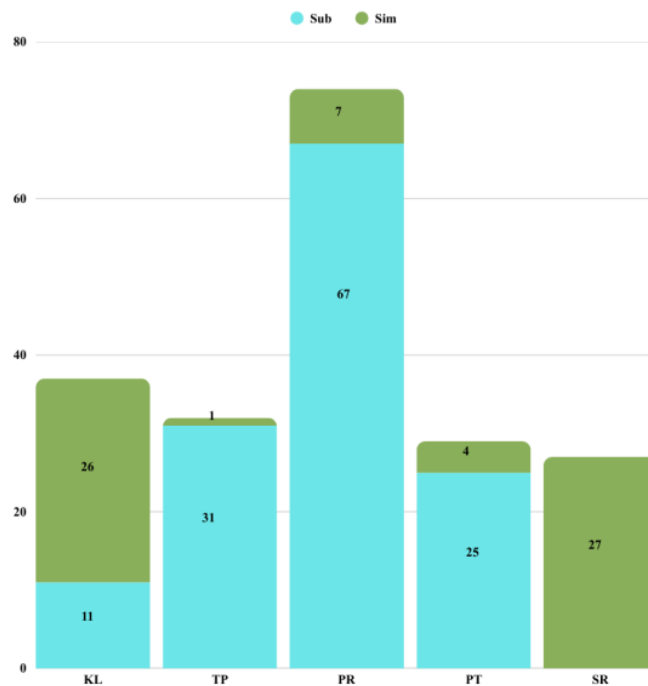
To ensure the consistency and reliability of the analysis, an intercoder validation process was conducted. Twenty percent of the data analysis units were coded independently by two coders, then compared and discussed to reach agreement on the interpretation of categories and classification representations,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

## **RESULT AND DISCUSSION**

### **Result**

The results of the content analysis of the local government's smart city website show that environmental sustainability is primarily represented through substantive legitimacy, as shown in Figure 1. Most of the analyzed content provides information on environmental programs implemented by the local government, including waste management activities, city greening, development of green open spaces, and various environmental education initiatives for the community (Ministry of PUPR, 2023). In addition to operational programs, several local governments also display information on environmental policies implemented, including waste reduction, energy management, and collaborative activities with local communities. This information is generally presented in the form of activity news, program reports, activity documentation, and policy publications related to sustainability issues. On the other hand, symbolic representations of legitimacy are also found in several forms of expression. This symbolic content generally emerges through narratives of

commitment to sustainable development, environmental slogans, and visual elements such as green icons, eco-friendly city illustrations, and graphic designs that emphasize the smart city identity. However, the proportion of symbolic content is relatively smaller compared to content that displays the local government's actual programs and activities. These findings indicate that smart city websites are used not only as institutional communication tools but also to publicize government activities related to environmental management. Thus, the disclosures appearing on these digital platforms reflect local governments' efforts to showcase the various environmental programs and activities they have implemented.



**Figure 1. Comparison by Category and Representation**

Source: Authors Work, 2025

## Discussion

Environmental policy commitment indicators show that many local governments have implemented various strategic policies related to environmental management, such as waste reduction programs, green open space development, and more sustainable energy management. This disclosure reflects a form of substantive legitimacy because the local government not only conveys a narrative of commitment but also displays formal policies that form the basis for implementing environmental programs. From the perspective of Suchman's (1995) legitimacy theory, the presentation of these policies serves to demonstrate that the local government is attempting to align governance practices with evolving social values regarding the importance of environmental sustainability. By openly displaying policies on the smart city website, the local government seeks to build public trust that environmental issues are part of the real policy agenda.

Environmental program and activity indicators are among the most common forms of disclosure on smart city websites. Local governments actively publicize various operational activities, such as waste management programs, city greening initiatives, waste bank development, and environmental education programs, to the public. This disclosure reflects substantive legitimacy because the information presented demonstrates concrete government actions in addressing environmental issues. From a public accountability perspective, the delivery of these programs and activities serves as a form of accountability to the public regarding the implementation of environmental policies. In addition, the publication of operational activities on digital platforms shows that local governments use websites to promote transparency in government activities.

Some local governments also display information regarding environmental program achievements in the form of data or activity reports. This data presentation reflects an effort to show evidence of performance that can be observed by the public. Within the framework of substantive legitimacy, the delivery of data-based information shows that the government is not only displaying activities but also striving to provide empirical evidence of the results of the policies it implements. However, the level of consistency in data presentation remains variable across regions, indicating that environmental performance transparency practices have not been fully standardized. This condition indicates that data-based disclosure is still in its early stages in local government digital communication practices.

In addition to substantive disclosures, some website content also features narratives about sustainable development visions, commitments to the environment, and statements on the importance of maintaining the city's ecological balance. These forms of disclosure confer symbolic legitimacy because they build the image of local government as an institution concerned with sustainability. These narratives typically appear as statements about green city development visions or commitments to sustainable environmental management. Although not always accompanied by data or evidence of program implementation, these narratives still shape public perception of the government's policy orientation toward environmental issues.

Indicators of visual representation are also found on various smart city websites, such as leaf icons, the color green, illustrations of eco-friendly cities, and slogans that emphasize the city's sustainable identity. These visual representations function as symbolic legitimacy, building an image of sustainability through the aesthetic elements of digital communication. In public communication, the use of visual symbols can strengthen the message the government seeks to convey about its commitment to sustainable development. However, compared to the disclosure of actual programs and activities, this symbolic representation plays a more supporting role in building the local government's communication identity.

## **CONCLUSION**

This study shows that sustainability disclosures on smart city websites of local governments in Indonesia are dominated by substantive legitimacy, reflected in the publication of environmental programs, operational policies, and various concrete activities related to environmental management. These findings provide a theoretical contribution by extending the application of legitimacy theory to the context of public sector digital communication, specifically by demonstrating that smart city platforms function not only as a means of symbolic image building but also as a medium for

representing substantive activities of local governments in responding to climate change issues. From a policy perspective, the results of this study indicate that smart city websites can be utilized more strategically as instruments of transparency and public accountability in communicating sustainability programs to the public.

However, this study has several limitations, particularly the limited scope of data on a number of local government websites and the focus of the analysis on published digital content, which does not fully describe the overall implementation of environmental policies at the operational level. Therefore, future research can expand the scope of the analysis by involving more regions, comparing disclosure practices across regions, and combining content analysis with other methods such as interviews or policy studies to gain a more comprehensive understanding of environmental accountability practices in the context of smart cities.

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