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Assessing Public Reaction to Artificial Intelligence in Promoting Green Tourism and Infrastructure Initiatives in Indonesia's New Capital Nusantara

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Abstract

This study aims to answer these questions by examining the effectiveness of green tourism marketing strategies by the Indonesian government, utilizing social media platforms Instagram and X (formerly Twitter), and learning how the public perceives its initiative. We collected comments on government posts promoting green infrastructure and tourism and analyzed them using a mixed-method approach. Sentiments were divided into three categories: positive, neutral, and negative, using Natural Language Processing (NLP) techniques. The results reveal a general negative reception of AI-authored advertising messages, amounting to 64.18% disapproving comments for Instagram and 81.93% for X, both expressing suspicion toward the overuse of AI and lack of authenticity calling into question transparency as well as genuine intentions behind sustainability goals. While a few responders gave positive reviews, the fact that so many responses were bordering or fully negative indicates that there needs to be clearer and more genuine communication strategies. Our research helps illuminate how the public perceives aspects of green tourism marketing, thus underscoring the significance of authenticity in promotional practices designed for sustainable development.

***Keywords**:* Green Tourism Marketing; Artificial Intelligence (AI); Public Perception; Ibu Kota Nusantara (IKN); Social Media Sentiment Analysis.

1. Introduction

Indonesia, with its breathtaking natural beauty and vast cultural landscape, is venturing into uncharted territory, building a brand new capital city, Ibu Kota Nusantara (IKN) (Rifaid et al., 2023). IKN itself is part of Indonesia's grand plan to move its capital away from Jakarta to East Kalimantan. Handbook of Moving National Capitals The project is slated to complete in 2045. The project is based on sustainable tourism development principles that consider infrastructure quality as a prerequisite for holistic sustainability. GGBS Green infrastructure is heavily reliant on nature and includes areas that are both natural and semi-natural, and has significance for biodiversity conservation, climate change mitigation, and a number of other ways through which it can enhance the quality of life (Monteiro et al., 2020). Eco-tourism allows further efforts by raising environmental awareness, developing local communities, and limiting the ecological footprint of travel activities (Wang et al., 2017). Showing a synergy between urban development and more responsible environmental ethics, the IKN project also hopes to act as an example of green initiatives in the region, showing how these go hand in hand with developing any kind of infrastructure, tourism, and sustainable development.

As ambitious IKN develops into something bigger and more worthy of attention, the government has also stepped up its social media campaigns to spur interest and ensure that its grand development plan continues to move forward. However, questions have been raised regarding the 'fit' between these strategies and wider development objectives. The use of AI to illustrate the future of IKN (especially in green tourism infrastructure) has triggered serious debate. As an understudied mechanism of sustainable IKN, the public response to these AI-driven campaigns is presented as a critical determinant of whether such strategies are accepted by the public. The public use artificial intelligence in green tourism and green infrastructure initiatives is not only a crucial yet under-studied dimension of sustainable IKN, but also critical to stimulate public acceptance. Additional research can provide a great deal of information about

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public opinion (Sivarethinamohan, 2023). Social media discussions, group polls, news, and public forums reveal people's attitudes, personal preferences and fears (McGregor, 2019).

This research seeks to fill this knowledge gap and explore the general opinion on the implementation of artificial intelligence for Green Infrastructure and tourism by evaluating respondents in Indonesia. This study also measures the level of public endorsement and concerns about how AI can be used to create sustainable tourist environments while aiding in the management of urban infrastructure. Additionally, this analysis aimed to explore the barriers and drivers that may impact community participation in initiatives related to AI-led green development.

2. Literature Review

2.1. Green Tourism

Green Tourism as a concept has basked in increasing limelight in the last few years as a mechanism to foster responsible growth in the tourism segment. Green Tourism refers to tourism with low-carbon environmental protection, energy saving, and emission reduction in ecological-human-culture integrity, that is, under the view of harmonious development between tourists' recreation and the environment. Ecotourism is a type of nature-based tourism that has become a popular substitute for traditional models since its emergence in the late 1970s (Pan et al., 2018). For rural communities, ecotourism is frequently promoted as an option for sustainable development because it can simultaneously support economic growth and environmental conservation (Teh & Cabanban, 2007). Green tourism development, focusing on ecotourism, has been seen as one of the main alternatives for promoting sustainability in many territories, including Indonesia (Krisnatalia et al., 2022).

2.2. Green Infrastructure

Green infrastructure has emerged as a critical concept in urban planning and environmental sustainability, particularly in the context of rapidly urbanizing regions, such as Indonesia. However, the implementation of green infrastructure principles in Indonesia is limited in practice. As the Indonesian government moves forward with the development of IKN, the new capital city, it is essential to examine how green infrastructure can be integrated into the planning and design of this ambitious project (Maryati & Humaira, 2017). This approach encourages the active maintenance, development, restoration, and reconstruction of green networks (Zhai, 2012).

2.3. Public Reaction to Green Initiatives

Society's response to green initiatives, particularly in the green infrastructure and tourism sectors, has been shaped by growing environmental awareness and green consumerism in the context of tourism and leisure activities, which has increased the public's desire to make environmentally friendly decisions (Aziz et al., 2018). The tourism industry has begun promoting green lodging and eco-destinations (Hartmann & Apaolaza Ibáñez, 2006). Nevertheless, studies have shown that transparency and credibility are essential to prevent 'greenwashing' and maintain public trust (Rahman et al., 2012). For green infrastructure, benefits such as greater social equity and environmental enhancement (often gaining broad support) or concerns that costs will be too high or aesthetic needs may not be met are characteristics shaped by community perceptions (Yusof et al., 2018). Hence, the involvement of communities is fundamental to support the social acceptance and deliverability of green infrastructure projects as part of participatory planning processes (Terkenli et al., 2020).

3. Methodology

3.1. Data Collection

The data were obtained by scraping public user comments from two promotional posts published by the official @IKNNusantara accounts—one on Instagram and the other on X. These posts featured government-endorsed campaigns promoting green infrastructure and sustainable tourism in the context of Indonesia's new capital, Ibu Kota Nusantara (IKN). The Instagram post, published on November 15, 2023, gathered 144 user comments and over 7,000 likes, while the corresponding post on X received 564 replies and 125 likes by June 2024. Data extraction was conducted through Python-based web scraping scripts that complied with ethical data collection protocols. To support transparency and reproducibility, the full dataset has been made publicly available at https://bit.ly/4gA9TQw.

3.2. Sentiment Classification using NLP

The quantitative phase of analysis applied Natural Language Processing techniques to categorize the sentiment embedded in each user comment. A supervised machine learning algorithm, specifically a Random Forest classifier, was trained on a manually labeled sample set to detect sentiment polarity: positive, neutral, or negative. Comments were preprocessed and transformed using Term Frequency-Inverse Document Frequency (TF-IDF) vectorization to emphasize meaningful word patterns while reducing noise. Model performance was evaluated using cross-validation, achieving an overall accuracy of 87.3%.

3.3. Thematic Content Analysis and Clustering

Complementing the NLP-driven sentiment scores, a thematic content analysis was conducted to uncover latent discourses within the comments. Open coding

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was employed to inductively identify recurring motifs, such as "AI overuse," "greenwashing," "lack of transparency," and "unrealistic expectations." To enhance interpretive depth, comment networks were visualized using Gephi, an open-source graph analysis tool. The modularity class algorithm was applied to group comments based on shared vocabulary and sentiment orientation. This clustering method illuminated the discursive structures and community patterns underpinning each sentiment category and revealed how commenters collectively framed their critiques or support.

3.4. Integration of Mixed Methods

The integration of quantitative and qualitative data followed a parallel data analysis model in which both streams were analyzed independently and later synthesized. Quantitative results offered a macro-level view of sentiment distributions, while qualitative findings provided micro-level insight into the reasoning and emotional nuance behind those sentiments. The convergence of findings showed that dominant negative sentiment was driven by recurring criticisms of inauthenticity in AI-generated promotional materials, particularly concerning how future-oriented depictions of IKN failed to reflect the on-ground realities.

4. Result and Discussion

4.1. Demographic

This analysis focused on two central promotional posts. The content was posted on an Instagram on November 15, 2023, and 144 comments were received until June 2024. However, the content posted on X, made on November 15, 2023, exhibited a different interaction pattern. The volume of comments dramatically increased, reaching 564 tweets by June 2024. The peak interaction for the Instagram occurred on December 10, 2023, while the peak for X occurred on November 16, 2023, where most comments were concentrated.

4.2. Main Findings

Analysis results and percentages using Class Modularity technique.

Table 1. Analysis result.

Platform			
Instagram		**X.com**	
Response	**Percentage**	**Response**	**Percentage**
Positive	32,2 %	Positive	10,26 %
Neutral	3,62 %	Neutral	7,82 %
Negatives	64,18 %	Negatives	81,93 %

Based on the analysis presented in Table 1, employing the class modularity technique revealed that Indonesian netizens predominantly focused on the promotional strategies utilized by the @IKNNusantara account on X and Instagram. The analysis identified a significant proportion of comments reflecting negative sentiments towards these strategies. Specifically, the percentage of negative sentiments was notably high, reaching 64.18% on Instagram and 81.93% on X. Further examination of the data, as illustrated in Figures 1 and 2, indicated that the majority of comments and reactions from netizens were critical of the methods and approaches employed in the promotional campaign. A recurrent controversial issue was the use of AI, with the term "AI" frequently appearing as a prominent keyword on both platforms. This raised and intensified concerns regarding transparency in the ongoing development process.

AI content was deemed inauthentic and excessive, which was the main reason for negative responses. The most frequent narrative netizens provide regarding AI-generated content depicting IKN is that it must authentically depict the government's commitment to promoting IKN tourism. Although some netizens appreciate this content for promoting green development, the percentage is insignificant, with 32.2% on Instagram and 10.26% on Platform X acknowledging the well-explained illustrations. Another finding, although not too drastic, is that neutral comments on both platforms are below 10%. These comments often reflect netizens' ignorance or curiosity about the real conditions of IKN development. The primary issue is that the green promotion has not fully conveyed its intended message, resulting in negative comments becoming a significant factor to consider for the sustainable development of green tourism in IKN.

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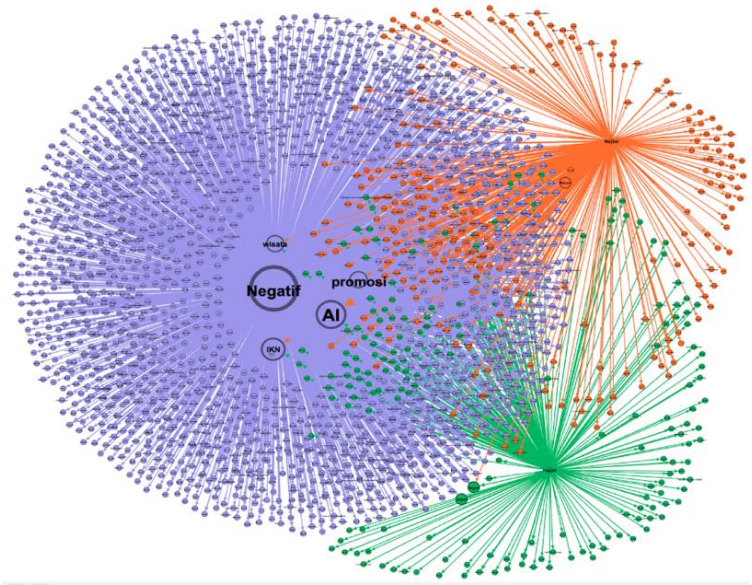

Figure 1. Comments on the X.com platform.

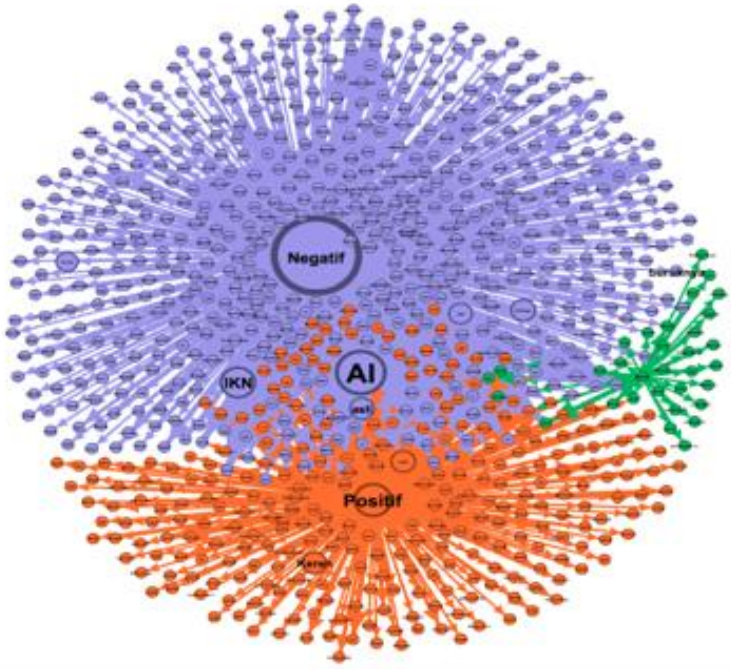

Figure 2. Comments on the Instagram platform.

The findings of this study highlight the growing prominence of AI marketing strategies in shaping developmental and future expectations. These strategies are not limited to creating content and gathering consumer feedback but extend to influencing the broader anticipations of both the government and society.

4.3. Fictional Expectations for Green Tourism

The relocation of the new capital city to East Kalimantan brings new hope for green tourism, especially within a governmental framework that prioritizes environmental sustainability. However, in the context of government promotion, a scenario emerged where AI has been used as the main strategy to promote green tourism. This approach has received both support and criticism from netizens, particularly regarding the government's commitment to these ideals. While AI can improve the efficiency and

effectiveness of green tourism campaigns, Indonesian netizens have expressed concerns about the government's sincerity in adhering to sustainability principles. Our findings across two major online platforms revealed a predominance of negative sentiments towards promotional content involving green tourism and infrastructure. Many people felt that AI-generated images should accurately represent the current state of development, leading to the perception that the government needs to seriously promote sustainable urban development in IKN.

This scenario reflects a fictional expectation crafted by the government to depict its vision of the archipelago's capital city. The promotion is based on pretenses, desires, hopes, and imaginations about future conditions (Beckert, 2013). In this case, the government seeks to convey the anticipated success of the sustainable development. However, this focus risks shifting from genuine green tourism promotion to merely advertising new capital using AI, potentially diluting the essence of a sustainable capital city. The absence of accurate portrayals of actual field conditions fuels public unrest regarding IKN's progress. Consequently, there are doubts about whether capital, as promoted by the government, will exemplify sustainable infrastructure amidst an unfinished process. Ultimately, this study highlights the government's failure to effectively promote green tourism and sustainable infrastructure by attempting to envision the future of IKN.

Reflecting on the experiences of other countries, such as India, the failure to effectively promote sustainable development and tourism has had severe repercussions on regional progress and public acceptance (Babu & Gade, 2014; Billa, 2022). In this context, promotional strategies must convey not only aspirations, but also rational expectations grounded in actual field conditions. This approach ensures that promotional efforts are credible and resonate with the public, thereby enhancing the potential for the successful implementation of sustainable tourism initiatives.

5. Conclusion

This research identifies strong public opposition to using AI to promote a new capital city (IKN). The AI's depiction of IKN's future and its efforts to attract support for green tourism is perceived as unrealistic, failing to accurately reflect ongoing development. This has led to significant negative reactions, posing a substantial challenge for gaining public support for green tourism initiatives. Consequently, public interest in visiting IKN and its green tourism projects is likely to decrease. The government needs to consider a more contextual and inclusive approach to gain better support from the community, especially in describing the future situation of green infrastructure that does not threaten the environment. However, this research requires significant improvements in several areas.

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