



Framing Smart City in Indonesia's New Capital: Integrating Technology, Culture, and Public Participation

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The relocation of Indonesia's capital from Jakarta to East Kalimantan is a strategic initiative to address critical issues such as traffic congestion, land subsidence, and severe air pollution, highlighting the urgency of enhancing national resilience. This article examines the application of the smart city concept in developing the new Ibu Kota Negara (Nusantara Capital City/IKN), focusing on integrating information and communication technology (ICT), creativity, and community engagement in urban planning while also exploring how these elements can be adapted to IKN and how prospect theory can be leveraged to boost public acceptance. Through a literature review of global smart city implementations, the study finds that applying smart city principles in IKN can significantly improve public service efficiency, environmental sustainability, and quality of life. Prospect theory suggests that well-framed policy communication can increase public support and reduce resistance to change. This research offers valuable insights for policymakers, providing practical recommendations for effective communication strategies and highlighting the importance of adapting the smart city concept to Indonesia's unique socio-economic context to strengthen national resilience.

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INTRODUCTION

Act Number 3 of 2022 outlines the government's strategic decision to relocate Ibu Kota Negara (Nusantara Capital City/IKN) from Jakarta to East Kalimantan, addressing pressing issues that have compromised Jakarta's viability. As Indonesia's administrative and economic center, Jakarta has become overwhelmed by unchecked population growth, severe traffic congestion, ground subsidence, and escalating air pollution. According to data from the World Population Review, Jakarta was ranked 28th among the most populous cities globally in 2023, with a population exceeding 11 million (Annur and Ahdiat, 2023). These conditions threaten residents' quality of life and strain the city's aging infrastructure. The severe congestion in Jakarta, positioning it as one of Asia's most congested cities, is a

key factor driving the capital's relocation. A report by Muhamad and Santika (2024), highlights that motorists in Jakarta require an average of 23 minutes to travel just 10 kilometres, making it the 9th most congested city in Asia. Furthermore, land subsidence, driven by excessive groundwater extraction, exacerbates the risks of flooding and clean water contamination, directly impacting public health (Zahira & Komalasari, 2023).

The Indonesian government has embarked on the ambitious project of constructing a new capital city, IKN, in East Kalimantan as a long-term solution to Jakarta's challenges and as a symbol of the nation's commitment to modernization and sustainability (Dewi, 2023). While this initiative is strategic, it presents significant challenges, particularly in designing and developing a capital that fully integrates the smart city concept, successfully implemented in major cities globally. Although developed countries have made considerable strides in smart city development, applying this concept in Indonesia—especially in a newly built capital—is novel and has received limited attention in global discourse. This highlights a broader research gap, particularly in designing and implementing smart cities in developing countries, where unique cultural, social, and economic conditions must be considered. Moreover, discussions about smart cities often focus predominantly on technological advancements. At the same time, important aspects such as creativity, community participation, and cross-sector collaboration are frequently overlooked yet are vital for successful implementation.

Given the phenomenon and the identified research gaps, this study explores “How can the smart city concept be adapted and implemented in Nusantara, Indonesia's new capital?”. The research examines the potential and challenges of establishing a smart city in IKN, focusing on integrating technology, creativity, and community participation to foster a sustainable and inclusive urban environment. The study aims to identify innovative approaches that could be employed in IKN to support physical development, enhance the community's quality of life, and promote environmental sustainability.

This research's findings are expected to significantly contribute to the existing literature and knowledge on smart cities, particularly in developing countries like Indonesia. It is also expected to serve as a valuable reference for the government and other stakeholders in formulating more effective and sustainable policies and strategies for developing IKN. Additionally, this research aims to enhance the understanding of collaboration between governments, the private sector, and communities in creating smart, inclusive, and sustainable cities. The study is particularly timely, addressing the application of the smart city concept in IKN, a new initiative not extensively covered in global literature. Furthermore, the research proposes a comprehensive approach to smart city development, emphasizing technological, social, cultural, and economic dimensions. Consequently, it is expected to offer fresh insights into how smart cities can be adapted and implemented in the unique context of Indonesia, which has distinct challenges and opportunities.

LITERATURE REVIEW

Prospect theory, developed by Tversky and Kahneman (1979), provides a new perspective on how individuals make decisions in uncertain and risky situations. Before this theory, decisions were generally understood through the "expected benefit" lens, where individuals were assumed to make decisions based on rational calculations of risks and returns. However, Kahneman and Tversky (1984) research reveals that decision-making is often irrational and heavily influenced by how information is presented or framed. Framing becomes crucial because the way in which a person frames a choice—as an advantage or disadvantage relative to a reference point—can significantly influence the decisions one makes.

Building on this understanding, prospect theory proves highly valuable for smart city development, as it aids in comprehending how stakeholders, governments, and the general public react to actions and policies implemented during the process. The framing effect, an essential aspect of prospect theory, highlights that presenting an outcome as an advantage or disadvantage relative to a reference point can significantly influence how individuals evaluate options (Raue et al., 2015). For example, presenting a policy, as outlined by Doktoralina & Apollo (2019), and Nugroho et al. (2024) in strategic management accounting practices on supply chain outcomes, as an attempt to reduce unemployment from 10 percent to 5 percent is likely to be perceived more positively than framing the same policy as an effort to increase employment rates from 90 percent to 95 percent, even though the outcomes are identical.

Smart cities, often promoted as solutions to urban challenges such as traffic congestion, pollution, and energy efficiency, can significantly benefit from how initiatives are framed. According to Abdellaoui et al. (2007) and Baucells & Villasís (2009), framing a policy that introduces smart grid technology as a means to reduce energy costs (a perceived gain) is likely to garner more support than framing it as a measure to prevent future energy shortages (a perceived loss). Consequently, prospect theory offers crucial insights for policymakers, enabling them to craft more effective communication strategies that enhance community acceptance and participation in smart city initiatives. By strategically framing policies, governments can increase public buy-in and facilitate the successful implementation of smart city projects.

Regarding how the government and other stakeholders can use framing techniques to maximize public acceptance of smart city projects in the IKN, the formulation of the problem in this article, "How can the application of the smart city concept be adapted and implemented in the IKN as the new capital of Indonesia?" is closely related to the prospect theory. The application of prospect theory is anticipated to assist in determining how smart city policies and activities might be more successfully communicated to the public to achieve the intended results. Furthermore, this article examines how the smart city idea is applied in IKN, focusing on how innovation, technology, and community involvement are adapted and integrated into sustainable urban development. A valuable framework for developing appropriate communication strategies that might maximize public support and decrease resistance to change can be developed by politicians and city planners through an understanding of prospect theory and its application in smart cities.

METHOD

The research method used in this article is qualitative with a literature review approach. The literature study was chosen because it allows researchers to study and analyze various smart city concepts and implementations in other cities worldwide. This approach is relevant considering the lack of empirical research on implementing smart cities in Indonesia, especially in developing a new capital city. According to Nyanchoke et al. (2020) and Nugroho et al. (2023), this research aims to build a solid theoretical foundation, identify gaps in the literature, and develop a framework that can be used to evaluate the implementation of smart cities in IKN. The study also considers how prospect theory can be applied to understand people's responses to smart city initiatives.

The data used in this study were obtained from various secondary sources, including scientific journals, books, policy reports, and articles on smart cities and urban development (Napitupulu et al., 2020; Oktris et al., 2022). The data sources were meticulously chosen based on their credibility and relevance to the research context. Data collection involved searching academic databases, including Google Scholar, JSTOR, and ScienceDirect, and non-academic sources such as government reports, news articles, and publications from

international organizations related to smart city development. This data encompasses examples of smart city implementation in cities such as Zürich, Oslo, Singapore, Malaysia, and others facing conditions and challenges comparable to IKN's.

The collected data was processed by categorizing information based on key themes such as ICT, creativity, innovation, community participation, cross-sector collaboration, and sustainability impacts. A descriptive-analytical approach was used to identify patterns and relationships in smart city implementations, focusing on adapting these insights to the specific context of IKN. The analysis considered Indonesia's unique cultural, social, and economic factors alongside potential challenges in implementing smart cities. Prospect theory was also applied to understand how policy framing can influence public acceptance, providing strategic insights for policymakers to enhance community support for the IKN project.

RESULTS AND DISCUSSION

Smart City Concept

Smart cities have become central in global discussions on modern urban planning and development (Neirotti et al., 2014). The concept revolves around utilizing information and communication technologies (ICT) to enhance the operational efficiency of cities, improve the quality of public services, and elevate the overall well-being of citizens (Tekinerdoğan et al., 2023). By integrating technology into city infrastructure, smart cities aim to create urban environments that are more sustainable, comfortable, and efficient (Apanavičienė & Shahrabani, 2023). This integration involves deploying various technological components, such as sensors, communication networks, and data analysis systems, enabling real-time, data-driven decision-making. Consequently, this facilitates more efficient management of resources like energy and water, monitoring air quality, regulating traffic, and providing emergency services. Furthermore, in the context of national resilience, as Doktoralina & Apollo (2019) outlined, the digital transformation of public services—encompassing areas such as taxation, education, public-private partnerships, and research innovation—can also be effectively implemented within smart city frameworks.

The concept of a smart city is inherently linked to the active participation of citizens in decision-making, where technology enables direct involvement in city planning and management through digital platforms that facilitate feedback and discussion on policies; this aligns with Tversky and Kahneman (1979), prospect theory, which suggests that framing information can significantly influence citizens' decisions to support or reject government initiatives, such as when a smart city policy is presented as a means to enhance quality of life by reducing congestion or increasing security, thereby garnering greater community support.

Conversely, innovation and the creative economy are crucial elements in the development of smart cities, encompassing not only technological advancements but also creativity in urban design, architecture, and public services, which can add value for citizens and stimulate local economic growth; cities like Zürich, Oslo, and Singapore have successfully integrated technology with the creative economy to foster dynamic and innovative urban environments that attract both residents and foreign investment (Richthofen et al., 2019). However, implementing smart cities extends beyond technology and innovation, requiring careful consideration of social, cultural, and economic factors, particularly in developing countries like Indonesia, where challenges such as low technological literacy, limited infrastructure, and insufficient community participation pose significant obstacles to practical implementation.

Moreover, the concept of smart cities can be linked to prospect theory, offering

valuable insights into how smart city policies and initiatives can be framed to enhance public acceptance. For example, framing smart city projects in Indonesia as solutions to urgent urban issues, such as traffic congestion and air pollution, rather than merely as modernization efforts is likely to garner greater public support, highlighting the importance of proper framing in effectively communicating the benefits of smart cities to the broader community.

Smart City Implementation in the Capital City of the Archipelago

Implementing smart cities in the archipelago's capital (IKN) is a critical component of the Indonesian government's strategic plan to address the challenges faced by Jakarta, such as traffic congestion, land subsidence, and air pollution (Ibrahim et al., 2023; Rifaid et al., 2023). Relocating the capital to East Kalimantan presents a unique opportunity to design a new city that integrates smart city principles from the outset, with a primary focus on developing robust digital infrastructure, including the construction of a 5G-based communication network, a smart grid for energy management, and a sensor system capable of real-time monitoring of environmental and city operations (Miceli, 2013), thereby optimizing resource use, reducing carbon emissions, and enhancing the efficiency of public services. However, the principal challenge lies in securing the substantial investment required to build this infrastructure and ensuring that the technology is accessible and utilized across all levels of society (Myeong et al., 2020; Temalagi et al., 2024), which necessitates the preparation of a comprehensive resource allocation plan to achieve these ambitious goals.

The implementation of intelligent transportation systems is crucial for the development of smart cities in IKN (Li et al., 2013; Tahmasseby, 2022), as it presents an opportunity for IKN to serve as a model for smart transportation in Indonesia, addressing the chronic congestion in Jakarta through the development of an integrated public transportation network, the adoption of electric vehicles, and the application of traffic management technologies aimed at reducing congestion and air pollution (Mohamed & Al-Shalfan, 2021; Yu-hui et al., 2020). When considered within the framework of prospect theory, policies introducing smart transportation technology are more likely to be effective if they are framed as efforts to reduce travel time and enhance the quality of life rather than merely as new technological initiatives. Additionally, renewable energy and innovative grid systems—also critical components of smart cities in IKN—will reduce dependence on fossil fuels and support the achievement of more ambitious environmental targets, such as reducing greenhouse gas emissions and increasing energy efficiency. Framing these energy policies as steps toward creating a healthier and more sustainable environment will likely garner greater public support and reduce resistance to change.

Citizen participation and collaboration between sectors are also the key to the success of smart city implementation in IKN (Meijer & Thaens, 2016; Mills et al., 2021). Governments can leverage digital platforms to involve citizens in decision-making, such as smart city applications allowing residents to provide input or report problems in their neighborhoods. Prospect theory suggests that how information and policies are communicated to citizens will greatly affect how they respond. For example, policies framed as an effort to increase community involvement in urban development are likely to get a more positive response compared to policies that ignore the community's voice.

In addition, IKN must also combine traditional and modern elements in urban design to create a unique and attractive identity. This approach will help build a sustainable city, promote local culture, and increase the IKN's attractiveness as a tourist destination and business center (Lata et al., 2022; Lee et al., 2020; Nugroho, Cetin, et al., 2023). In the context of prospect theory, these policies can be more effective if they are framed as an

effort to preserve cultural heritage while modernizing urban infrastructure. However, several challenges must be overcome in implementing smart cities in IKN, including low community participation, limited technological literacy, and resistance to change. Using prospect theory, governments can identify ways to increase public participation and acceptance of smart city initiatives through proper framing. For example, policies that reduce social disparities and improve access to public services can help overcome resistance and encourage community participation.

CONCLUSION

Implementing the smart city concept in IKN offers a strategic response to Jakarta's challenges, such as traffic congestion, land subsidence, and air pollution, by integrating technology with social, cultural, and economic aspects tailored to Indonesia's status as a developing country. However, the success of this initiative depends on effective policy framing, collaboration between the government, private sector, and community, and the seamless blending of traditional and modern elements in urban design.

Given the challenges of low technological literacy and limited community participation, future research should explore strategies to overcome these barriers and develop frameworks for continuous community engagement. The government and researchers must ensure that smart city developments align with local needs and expectations, emphasizing policies that promote quality of life and environmental sustainability to gain public support and participation.

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