Effectiveness of the Integrated Utility Network Policy on the Urban Aesthetics of Medan City

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Abstract

This study aims to evaluate the effectiveness of the Integrated Utility Network (SJUT) policy in improving the urban aesthetics of Medan City. The method used is a combination of descriptive qualitative and light quantitative approaches through interviews, observations, and surveys involving 100 respondents across four main urban corridors. The findings show that the implementation of SJUT improves the visual order of urban space, reduces visual disturbances caused by overhead cables, and strengthens policy integration toward Medan Smart City development.

Keywords: Urban Aesthetics, Public Policy, Integrated Utility Network, Medan City.

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Introduction

As one of Indonesia's major metropolitan cities, Medan faces significant challenges in managing urban utility infrastructure that often leads to visual disorder in public spaces. Tangled overhead cables, unorganized water pipelines, and lack of coordination among institutions have degraded the city's aesthetic quality. The Medan City Government initiated the Integrated Utility Network (SJUT) policy to restructure the utility system for greater efficiency and visual harmony. This research is novel as it explores how the policy contributes to the realization of Medan Smart City through urban design and infrastructure integration.

Literature Review

SJUT represents an integrative policy framework designed to manage various urban utility networks within a single underground system. Lynch (1960) emphasized that visual order is a key element in shaping the image of a city. Previous studies have shown that integrated utility network planning can enhance spatial efficiency and urban aesthetics. However, its effectiveness depends on policy coordination, funding mechanisms, and public participation.

Research Methodology

This study employs a mixed-method approach. Qualitative data were collected through interviews with officials from the Spatial Planning Department and utility managers, while quantitative data were derived from surveys involving 100 respondents across four main corridors: Gatot Subroto, Balai Kota, Zainul Arifin, and Diponegoro. Respondents assessed policy effectiveness and aesthetic changes using a Likert scale (1–5). Data were analyzed using mean score analysis and effectiveness categorization.

Results and Discussion

The Medan Mayor Regulation (Perwal) No. 53 of 2023 serves as a continuation of Perwal No. 46 of 2021 regulating the Implementation of the Integrated Utility Network (SJUT). This regulation is a significant milestone in the reorganization of Medan's underground infrastructure, especially telecommunication networks, to establish an orderly, aesthetic, and smart city environment.

Key Policy Points:

- Development Scope: Construction covers 71,265 meters across major roads, accommodating utility networks, especially telecommunications.
- Financing Scheme: The project does not use local government funds (APBD) but is financed through a Joint Operation (KSO) with private partners.
- Operator Obligation: All telecommunication operators are required to relocate overhead cables underground into the SJUT facilities.
- Objectives and Benefits: Improve comfort, order, city aesthetics, and environmental sustainability.
- Regulatory Assurance: The regulation provides legal certainty and policy continuity in spatial and infrastructure management.

Table 1. Identified Root Problems and Urban Planning Implications

Aspect	Root Problems	Implications for Urban Planning
Institutional & Regulation	Policy synchronization between Medan City Government, telecom operators, and private investors requires stronger coordination.	Potential authority overlap and project delays.
Funding & Investment	Non-budgetary (KSO) scheme presents challenges in quality control, benefit sharing, and investment sustainability.	Need for transparent and accountable financing models..
Technical & Infrastructure	Relocation of overhead cables underground requires multi-sector coordination.	Risk to existing infrastructure; need for integrated data systems
Social & Aesthetics	Relocation of overhead cables underground requires multi-sector coordination.	Public engagement needed to support aesthetic improvements.
Smart City Readiness	SJUT not yet fully integrated with digital management systems.	Need integration with smart city platforms

Survey results indicate that the average policy effectiveness score of the Integrated Utility Network (SJUT) is **4.1**, while the public perception of urban aesthetics reached **4.3**. A significant improvement was observed in the **Balai Kota** and **Diponegoro** corridors, which are now more orderly and less cluttered with overhead cables. However, challenges related to **inter-agency coordination** and **budget constraints** remain obstacles to full implementation.

Table 2. Impact Assessment of SJUT on Urban Spatial Order and Aesthetics

Corridor	Policy Effectiveness	Aesthetic Score	Category
Gatot Subroto	4.0	4.2	Effective
Balai Kota	4.3	4.5	Highly Effective
Zainul Arifin	3.9	4.1	Effective
Diponegoro	4.2	4.4	Highly Effective

From the table, it is evident that all corridors show an **aesthetic improvement above 4.0**, indicating that the **SJUT policy has had a positive impact on urban spatial organization and visual order**.

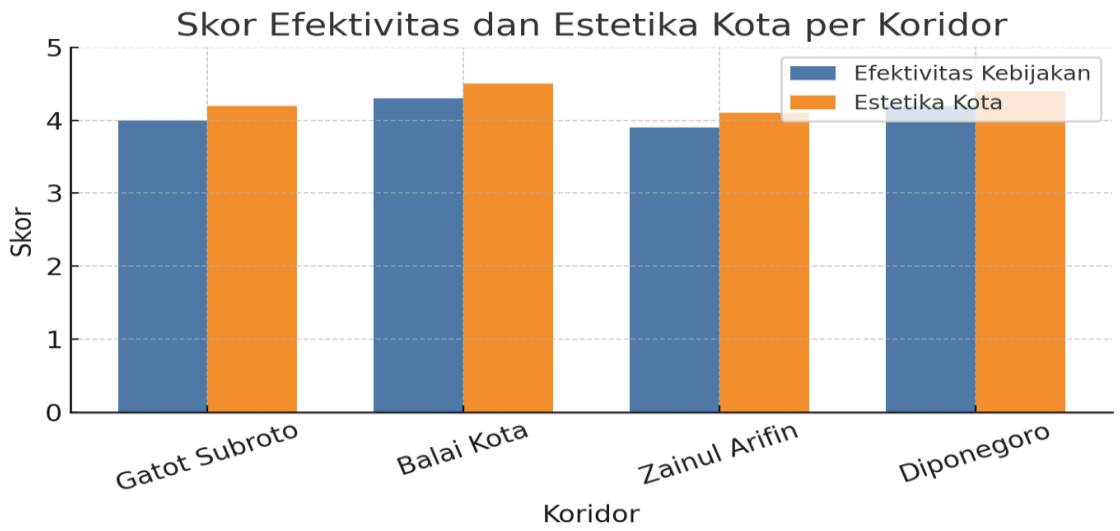

Figure 1. City Effectiveness and Aesthetics Scores per Corridor

Problem Formulation

Based on the analysis of root problems, the research problem formulation can be structured from general to specific levels as follows:

General Research Question: How effective is the implementation of the Integrated Utility Network System (SJUT) based on Medan Mayor Regulation No. 53 of 2023 in supporting integrated and sustainable urban infrastructure governance toward Medan Smart City?

Specific Research Questions:

1. Institutional & Governance: How is the coordination among government institutions, telecommunication operators, and private parties?
2. Funding & Investment: How effective is the non-APBD Joint Operation (KSO) scheme?
3. Technical Integration: To what extent has the underground utility network been integrated with existing infrastructure and smart management systems?
4. Social & Aesthetic: How do people perceive landscape changes after SJUT implementation?
5. Sustainability & Smart City: How sustainable and ready is SJUT for integration into Medan Smart City?

Conclusion

The SJUT (Integrated Utility Network System) policy in Medan City has proven effective in improving the orderliness and aesthetics of public spaces. The average scores for policy effectiveness and public perception indicate that the program is both effective and positively received. The main challenges lie in inter-agency coordination and financing. The government needs to strengthen regulations and cross-sector collaboration while raising public awareness of the importance of urban aesthetics.

Based on the findings of this study, the Medan Mayor's Regulation (Perwal) No. 53 of 2023 regulates the implementation of the Integrated Utility Network System (SJUT) in Medan

City. This regulation serves as the policy foundation and procedural guideline for the development and management of integrated underground utility networks aimed at supporting urban orderliness, visual aesthetics, and the Medan Smart City initiative.

Key points related to the integrated utility system in Medan City as stipulated in Perwal No. 53 of 2023 are as follows:

- The regulation governs the construction of an integrated telecommunication utility network spanning approximately **71,265 meters** across various streets in Medan City.
- The program is **not financed through the regional budget (APBD)** but through **joint operational cooperation (KSO)** with private companies. This non-APBD financing scheme demonstrates innovation in urban infrastructure funding. However, the mechanism still requires clarity regarding responsibility-sharing, quality control, and operational sustainability.
- All telecommunication operators are required to **relocate their overhead cables underground** into the integrated utility network system.
- The development of SJUT aims to **enhance comfort, order, and city aesthetics**, while also promoting **environmental sustainability**.
- This regulation continues the provisions of the previous Mayor's Regulation (No. 46 of 2021), providing **regulatory certainty** for telecommunication operators.
- **Institutional and stakeholder coordination** (local government, telecommunication operators, and private investors) remains the main challenge. The lack of cross-sectoral planning integration has led to suboptimal spatial and functional implementation of the SJUT.
- **Technical integration** among various utilities (telecommunications, electricity, water, gas, and drainage) has not yet been fully realized. The absence of a centralized infrastructure database and limited availability of utility geographic information systems (GIS) hinder project efficiency and safety.
- From the **social and urban aesthetic perspective**, the public generally supports relocating overhead cables underground. However, negative perceptions persist regarding disruptions during construction and the lack of public outreach.
- Overall, **Perwal No. 53 of 2023** provides a clear policy direction, but it still requires strengthening in governance mechanisms, data systems, and cross-sector collaboration to ensure that the SJUT truly becomes the foundation for sustainable smart urban infrastructure in Medan City.

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