News Mapping Analysis on Indicators of Smart City in Indonesia

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Abstract. The application of the Internet of Things (Iot) in governance in Indonesia is increasingly encouraged by the "Movement Towards Smart City". The purpose of this research is to find out how news mapping about Smart City indicators in Indonesia. The method used is a qualitative research method by relying on data sources - secondary data. These sources include official news media reports for the 2019-2023 period. The results of this study show that the news site that narrates the Smartest City indicators is Republika news site. The most narrated Smart City indicator is the indicator of Smart Mobility, where the news that appears most often is about the development of internet networks in Indonesia. Smart Mobility is the most dominant indicator reported on the five news sites because in Indonesia itself, the internet network, digitalization is something that is experiencing significant development. With the rise of digitalization in Indonesia itself as a form of implementation of Smart City Indicators, Smart Mobility, of course, the government must begin to be able to implement other Smart City Indicators, such as Smart Environment, Smart Economy, Smart Living, Smart Governance and Smart People. There needs to be a policy from the Government of Indonesia itself to maximize the Smart City indicators.

1. Introduction

The application of the Internet of Things (IoT) in governance in Indonesia is increasingly encouraged by the "Movement Towards Smart City." This movement was launched by the Ministry of Communication and Information Technology in 2017. The Ministry of Communication and Informatics believes this movement is essential because it is estimated that 83 percent of people in Indonesia in 2045 will live in cities. Therefore, it is necessary to carry out intelligent urban planning to help overcome potential problems. (1).

Smart City conditions in Indonesia have begin to be implemented. There are several cities and regencies in Indonesia that have implemented Smart City and received the Movement Towards 100 Smart City award in 2017, namely: Banyuwangi Regency, Tomohon City, East Lombok Regency, Sukabumi City, Bandung Regency, Samarinda City, Bandung City, Semarang City, Tangerang City, Sleman Regency, Bekasi City, Bogor City, Cirebon City, Pelalawan City, Banyuasin Regency, Bojonegoro Regency, Gresik Regency, Sidoarjo

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Regency, Makassar City, South Tangerang City, Mimika Regency, Kutai Kartanegara Regency, Jambi City and Siak Regency (2).

This research aims to find out which news sites display and narrate the most news about Smart City Indicators using Giffinger's Smart City Theory (2007). Gifingger explains that smart cities are regional competitiveness, ICT and transportation, economy, natural resources, human and social resources, quality of life, and community participation in their city government. According to Giffinger's theory, there are 6 Smart City indicators: Smart People, Smart Mobility, Smart Economy, Smart Living, Smart Environment, and Smart Governance. The novelty of writing this article is to analyze the implementation of indicators from Smart City because, based on the research gap in writing, this article is based on previous research in analyzing Smart City indicators only sourced from articles or journals related to Smart City and no one has analyzed from online news sources. The news sites used for this mapping are Antara, Detik, Kompas, Liputan 6, and Republika.

2. Literature Review

In Indonesia, *smart mobility* has been widely implemented; the parameters of intelligent mobility are the availability of ICT infrastructure, which is related to the Internet of Things (IoT), and a sustainable transportation system. Based on research conducted by (3), The government and Kominfo are developing a tourism-based digital ecosystem or smart tourism that is useful for improving tourist experience and satisfaction. In Indonesia, an IoT-based flood inundation monitoring system has also been implemented, which includes a water level reader and a web-based inundation monitoring system. (4). Pekanbaru City also applies the smart city concept with *Smart Mobility* indicators, namely the implementation of the Pekanbaru Command Center.(5). In Central Java there is a Bus Rapid Trans (BRT) facility, namely Trans Jateng, which is used as a strategic step in the revival of public mobilization (6).

Smart living is also a significant indicator of the implementation of Smart City with parameters such as strong security and the availability of health facilities. Results of research conducted (7), In Bandung, one form of effort to implement strong security is by implementing a monitoring system, a crime prevention system, and 132 CCTVs installed at 40 intersections in the city. Smart Living also requires cybersecurity to protect information systems and services from unauthorized access. (8).

Another Smart City indicator is *a Smart Environment* with the parameter of good waste management. Based on research results from (9), The Indonesian government has provided various waste management facilities in landfills, recycling technology, composting houses, and waste banks. However, from the parameters of green open space, a program needs to be implemented to maintain its balance. Based on research results from (10) Also revealed, in Semarang, there is already an implementation of Smart Waste Recycling, supported by internet-based technology that the public can access. The public can control mass waste generation and recycling management and know how much recycled waste is.

Another Smart City indicator, Smart Governance, is no less critical with transparent governance parameters. Smart Governance is related to E-government, SPBE, ICT Evaluation, and E-Government ranking evaluation. (11). Research conducted by (12), It also results in the implementation of the Bandung City Government by providing information on the results of the performance of the Bandung City Government, which aims for transparency, accountability, and community involvement.

Regarding other *Smart City* Indicators, namely Smart Economy, based on research from (13) Explained that the application of this Smart Economy can form a smart labor market that is more flexible and adaptable in today's digital world. The development of IKN also requires a large workforce and the development of labor markets through digital platforms. Other

studies also say that to realize an intelligent economy, economic growth, and community welfare must be achieved by creating a setup in the industrial sector and the Islamic economy. (14). The utilization of electronic payments is also growing at this time, one of which is YAP (Your All Payment) Mobile Payment issued by Bank BNI. (15).

Another Smart City indicator is *Smart People* ; Smart *People* relate to people's participation in the public where they contribute to the public decision-making process (16). *Smart people* are also made as a foundation that is supported by a smart environment to produce a smart quality of life (17). Surabaya City Government implemented a human resource improvement program for the community, the Broadband Learning Center (BLC), which helps overcome inequality (18). Research results from (19) explained that people in Pekanbaru City are not ready to face Smart City, evidenced by the interaction of its people on social media, Twitter, where the interaction rate only reaches 0.031%. Research results from (20) explained that Surabaya City already has a contestation of its HR development index marked by the formation of communities. Meanwhile, Malang City has developed a network of relationships between communities. Jakarta City Government launched the Citizen Relation Management (CRM) application for online reporting of public complaints as a form of community participation. (21).

3. Method

The research method used in this research is qualitative research, where this qualitative approach collects data comprehensively about the case or research topic. The collection technique in this research is qualitative, relying on secondary data sources. These sources include official mass media reports for the 2019 - 2024 period, as well as previous studies relevant to the topic discussed.

Tables 1. News Source and Amount

Mass Media	Amount
Antara	10 news
Detik	10 news
Kompas	10 news
Liputan 6	10 news
Republika	10 news

The limitations in this study are (1). Not all news sites display news about indicators of Smart City, (2) Not all news sites provide views or have special attention on Smart City in Indonesia. The focus of this research is to map news about indicators of Smart City, namely Smart Economy, Smart Living, Smart Environment, Smart Mobility, Smart People and Smart Governance. The scope of this research is Smart City in Indonesia. This article is the result of descriptive qualitative research using secondary data. Secondary data used are files, documents from previous research relevant to the topic and corroborated with online news media data. The data is processed and analyzed using Nvivo 14 software. This research is linked to the data in the news as a parameter of Smart City.

4. Finding and Discussion

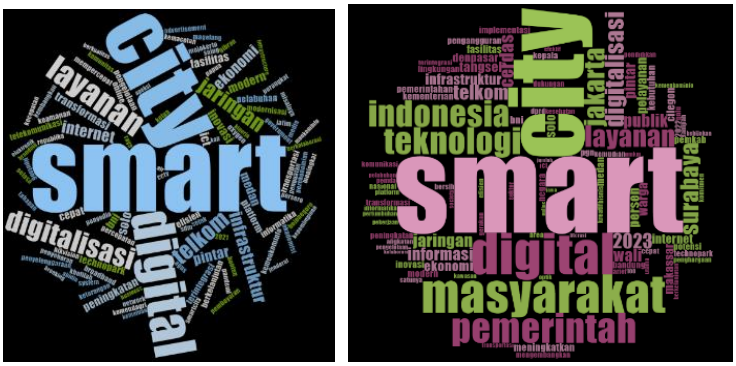


Fig. 1. Word Cloud Source : Data Processed by Authors Using Nvivo14

Tables 2. Frequently Appearing Entities

No.	Keyword	No.	Keyword	No.	Keyword
1	Smart	11	Solo	21	Technopark
2	City	12	ICT	22	Terintegrasi
3	Digital	13	Medan	23	Pelabuhan
4	Layanan	14	Inovasi	24	Telekomunikasi
5	Telkom	15	Modern	25	Berkelanjutan
6	Jaringan	16	BNI	26	Informatika
7	Infrastruktur	17	Fasilitas	27	Online
8	Internet	18	Transformasi	28	Transportasi
9	Ekonomi	19	Peningkatan	29	Modernisasi
10	Pintar	20	Cepat	30	Percepatan

4.1 Mapping News about Smart City

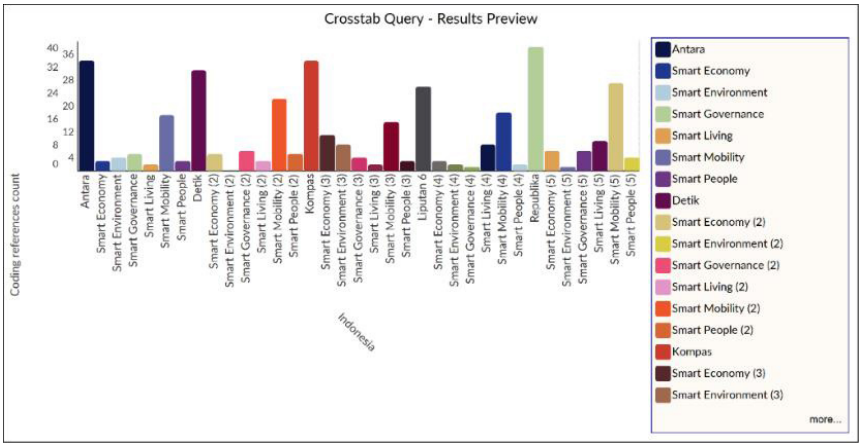


Fig. 2. Mapping News about Smart City Source : Data Processed by Authors Using Nvivo14

Figure 2 shows that of the five news sites that display news about Smart City in Indonesia, Republika is the news site that displays the most news about Smart City. In addition, the Smart Mobility Indicator most narrated by news sites is the Smart City Indicator. Smart

Mobility has the highest value on each news site: Antara, Detik, Kompas, Liputan 6, and Republika. Republika news site is the news site that pays the most attention to Smart City.

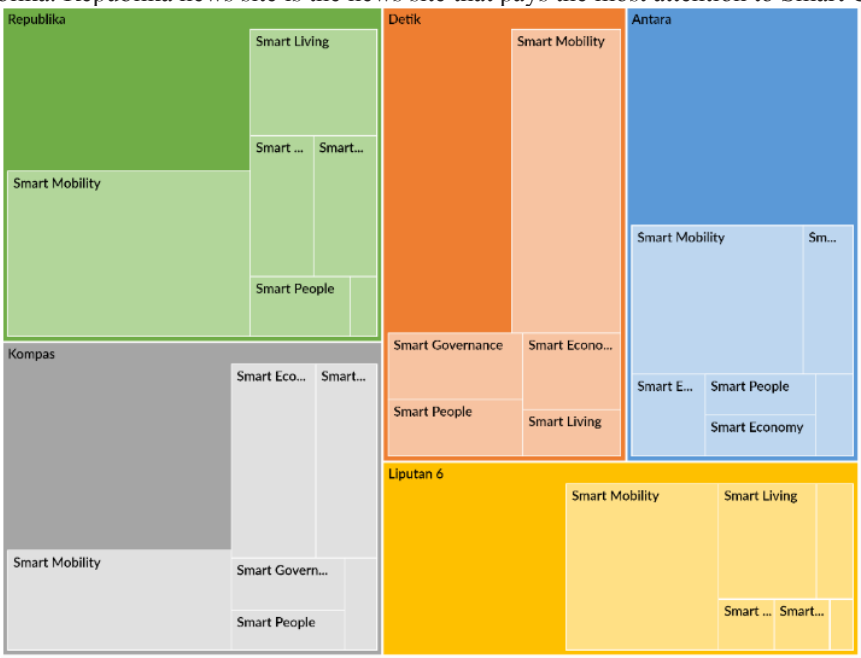
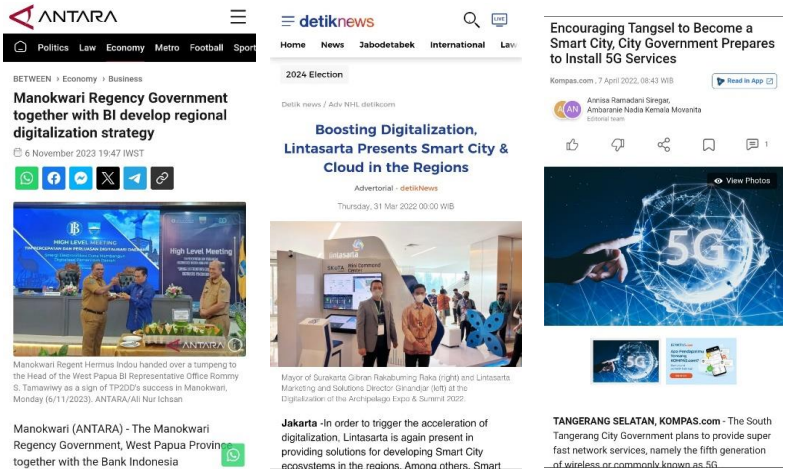
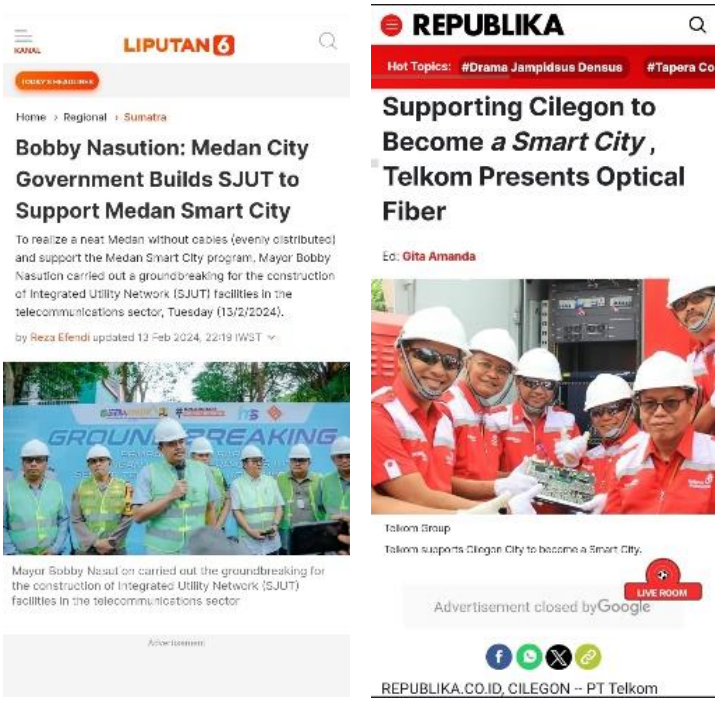


Fig. 3. Hierarcy Chart Smart City News Source : Data Processed by Authors Using Nvivo14

Figure 3 above can be concrete evidence that Republika is the news site that most often displays news about Smart City. The indicator of Smart City, namely Smart Mobility, appears most dominantly on the five news sites such as Republika, Kompas, Liputan 6, Detik, and Antara. The Republika news site and the Kompas news site show the density of news sites displaying news about indicators of Smart City. Smart mobility is indeed a hot topic in Indonesia, and it is related to information and communication technology development.

4.2 Headline News Smart Mobility Indicators





The images above are news headlines from news sites that narrate news about Smart Mobility indicators in Indonesia; the news sites consist of Antara, Detik, Kompas, Liputan 6, and Republika news sites. Giffinger, in his Smart City theory, explains that the parameter of Smart Mobility is the availability of information and communication technology infrastructure. In Indonesia itself, the development of telecommunications is growing, especially in terms of digitalization. Based on this, the news headlines above show evidence that several regions in Indonesia have begun to digitize their respective regions to illustrate the development of information and communication technology, such as the cities of Medan, Tangerang, and Cilegon.

In addition to the development of information and communication technology, the implementation of Smart Mobility in Indonesia can be proven by the existence of regional areas that have implemented sustainable transportation, such as Central Java, which has implemented Bus Rapid Trans (BRT) (6), Jakarta which implements a Transit Oriented Development (TOD) concept where the TOD contains transportation integration that connects Transjakarta bus stops with MRT, LRT, and KRL Commuter Line stations (22).

Therefore, with the rise of digitalization in Indonesia itself as one form of implementation of the Smart City Indicator, namely Smart Mobility, of course the government must start to be able to implement other Smart City Indicators, such as Smart Environment, Smart Economy, Smart Living, Smart Governance and Smart People. There needs to be a policy from the Indonesian government to implement the Smart City concept along with other indicators so that the implementation of Smart City in Indonesia can run well and optimally..

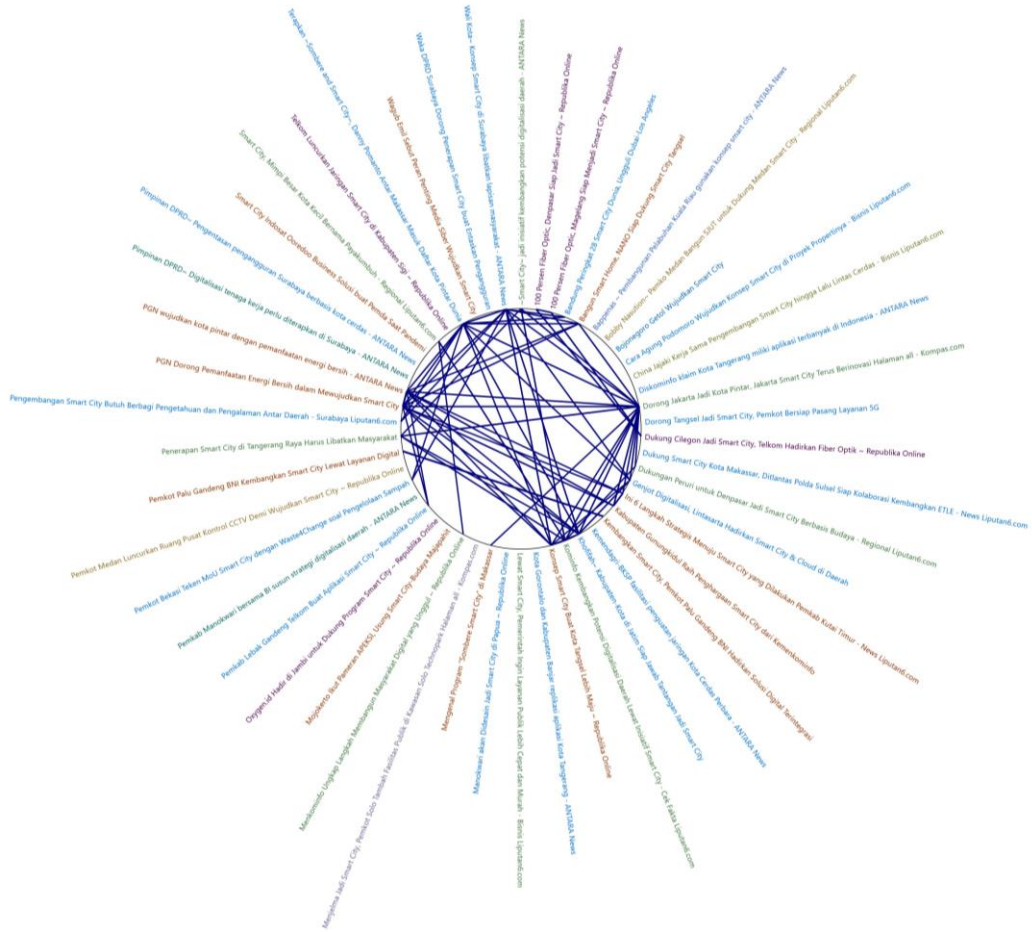


Fig. 4. Word Similarity Source : Data Processed by Authors Using Nvivo14

Figure 4 is a visualization of Word Similarity obtained from the results of coding using Nvivo 14 software. The figure explains that there are similarities in words from the results of coding news using Nvivo. The similarity of words depicted is the word "Smart City is an initiative to develop the potential of regional digitalization" (Antara News) with the words "Kominfo Develops Regional Digitalization Potential Through Smart City Initiative" (Liputan6). Furthermore, there are the words "Develop Smart City, Palu City Government Ganders BNI to Present Integrated Digital Solutions" with the writing "Palu City Government Ganders BNI to Develop Smart City through Digital Services" and many more. The similarity of words narrates about digitalization, networking, and smart traffic. The similarity of words is an indicator of Smart Mobility. This similarity of words shows that each news site from Antara, Detik, Kompas, Liputan 6, and Republika narrates the same thing about the indicators of a Smart City, namely Smart Mobility, and illustrates that these five news sites are equally concerned about Smart City in Indonesia.

5. Conclusion

Smart Mobility is the most widely narrated Smart City indicator by News Sites in Indonesia, especially the Republika News site. The implementation of Smart Mobility in Indonesia is proven by news narratives about several regions in Indonesia that have begun to digitize their respective regions to describe the development of information and communication technology, such as the cities of Medan, Tangerang, and Cilegon, as well as the implementation of BRT in Central Java and Transit Oriented Development (TOD) in Jakarta. The recommendation for further research is to conduct news mapping on more than 5 news sites in Indonesia to find out more about news mapping regarding Smart City in Indonesia. The limitations of this study are that not all existing news sites display news about Smart City and not all news sites provide special views or attention to Smart City in Indonesia.

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