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Leadership in Smart Cities & Urban Innovation: The Role of Leadership in Creating a Smart City Based on Technology and Sustainability

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***Abstract**: Leadership role in realizing a sustainable and technology-based smart city. The smart city concept emphasizes the integration of information and communication technology (ICT) to improve efficiency, quality of life and sustainability in the urban environment. This study uses a literature study method by analyzing various academic and policy sources related to the implementation of smart cities in Indonesia. The research results show that transformational leadership has a crucial role in driving the success of smart cities, especially in the aspects of sustainability and human resource development. However, smart city implementation faces various challenges, such as resistance to change, limited resources, as well as data privacy and cybersecurity issues. To overcome these obstacles, effective collaboration between government, the private sector and society is very necessary. In addition, innovative and participative leadership strategies have been proven to increase the effectiveness of smart city implementation. With the right approach, smart cities can have a positive impact on the regional economy and improve the quality of public services.*

***Keywords**: Digital Transformation, Government Collaboration, Information Technology, Leadership, Smart City, Sustainability.*

1. INTRODUCTION

In today's technological developments that trigger the development of the use of public facilities in a city, the transition to smart cities reflects important changes in the development of urban areas, which incorporate technology in improving efficiency, sustainability and quality of life in urban areas. This transformation was triggered by the need to address pressing urban issues, such as congestion, pollution, resource management, and public security (R. Y. Maulana et al., 2025). Thus, Digital Skills Development: One of the major impacts of digital transformation is the need to enhance digital skills in HR. Skills such as understanding technology, data analysis and the ability to use digital tools are now very important in the world of work. Organizations need to utilize targeted training and development programs to ensure employees have skills that suit the demands of today's digital era (Fatahillah et al., 2023).

The use of technology by humans to help complete tasks is a necessity in everyday life. This technological development must be in line with improving the quality of human resources. As technology users, humans need to be able to utilize current technology and follow future technological developments. Technology functions as a new innovation to create products, both goods and services, that make human work easier. With the increasingly widespread use of technology to make work easier, humans continue to innovate in creating new technology to

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maximize existing resources. Therefore, technological development is an important factor in supporting the quality of human resources (Nikmah et al., 2023). Future urban development will depend heavily on cities adopting a sound approach to an environmentally friendly and sustainable transition, by encouraging and renewing people's responsible behavior in their consumption choices. The cities of the future will play a role in creating sustainable and prosperous growth, which in turn will encourage more responsible consumption behavior. Adopting a vision of sustainable and responsible consumption in urban areas will help shape cities as communities capable of encouraging efficient, effective, inclusive and environmentally friendly growth, as well as reducing sources of pollution and environmental damage (Naples & Business, 2025).

This research is also very useful for the community because it makes their activities easier, besides that, many cities have also implemented it *Smart Cities* for example, several large cities in Indonesia have adopted concept innovation *Smart Cities* including Bandung and Bogor. In East Java, there are several cities that have also implemented the concept *Smart Cities*, such as Surabaya, Malang and Banyuwangi. Apart from that, Jember Regency, which is one of the large and densely populated cities in East Java, has also implemented this concept. This can be seen from the Jember Regent's efforts to implement the "Jember One Data" policy as the main basis of the concept *Smart Cities* in this area (A. Maulana & Haerah, 2021). To realize the smart city concept, a leader is needed who is transformational and innovative. Therefore, it is important to have a leadership model that is suitable for a leader. Transformational leadership can contribute to realizing the smart city concept, because this type of leadership has a positive impact on the resulting performance (Ardinata et al., 2022).

In realizing the smart city concept, careful planning and serious commitment are needed, as well as active participation from all stakeholders in the city. Often, smart cities are only understood as the application of technology in city management, without paying attention to community involvement in the development process. Information and Communication Technology (ICT) functions as a tool in the development of smart cities (Nikmah et al., 2023). This article aims to examine the contribution of technology in the development of smart cities, explore various challenges that arise during the implementation process, and emphasize the significance of community involvement and collaboration between various stakeholders in creating a smarter and more sustainable urban environment. In addition, this article also seeks to provide practical advice to governments and communities in formulating effective strategies to realize the smart city vision.

2. LITERATURE REVIEW

The concept of smart cities is to improve services and create a better quality of life. Smart cities are considered a good performance indicator for a region, because they are expected to have a positive effect on government and the social life of society in various sectors. In this context, all activities will shift to digitalization to simplify public services. In terms of definition, smart city has various meanings. Muliarto explained that a smart city is a way to connect physical, social and economic infrastructure in an area by utilizing Information and Communication technology (ICT), which can integrate all elements so that cities become more efficient and livable (Izzuddin, 2022). In building smart cities, of course the government also has several obstacles. Rigidity in administrative procedures and regulations is considered a significant barrier to innovation efforts in urban areas. Many city governments are not adequately prepared to utilize digital technology as a solution to the challenges they face, due to rigid management structures and limited resources. In particular, the technology acquisition process often presents significant bureaucratic challenges. Procurement procedures and regulations are considered outdated and actively hinder progress (José & Rodrigues, 2024).

Limitations in funding are also related to the level of flexibility. Traditional funding models, which follow annual budget cycles, can hinder adaptive project management, especially when unexpected business or technology opportunities arise. Therefore, a new and more responsive financing approach is needed, which can not only guarantee planned long-term investments, but also provide the flexibility necessary to face the demands of an ever-changing innovation environment (José & Rodrigues, 2024). Following are several examples of cities in Indonesia that have implemented most of the concepts *Smart Cities* The government can allocate funds for smart city projects through regional budgets, establishing public-private partnerships, or seeking other funding sources. This investment is very important to build the necessary infrastructure. Smart cities are generally related to the use of Information and Communication Technology (ICT), which plays an important role in infrastructure such as buildings, electricity, water, waste, transportation, and logistics, as well as in education, culture, policy, social participation, and governance. In Indonesia, smart city development continues, especially in big cities such as Surabaya, DKI Jakarta and Bandung. To support this initiative, the Ministry of Communication and Information together with several other ministries launched the Towards 100 Movement *Smart City* in 2017-2019. In 2019, Kupang City was selected from 25 cities/regencies to complement the previous 75 cities/regencies in developing smart cities and become an example for the region (Ledoh, 2019). By implementing

smart cities, technology facilitates faster and simpler access to public services, including transportation, health and education.

3. RESEARCH METHODS

This research method uses a literature study method which seeks relevant sources and, the aim of this study is to deepen knowledge about the role and application of government in creating smart city technology. The role of leadership is very important in realizing the smart city concept. The Indonesian Government targets to have 100 cities with the smart city concept by 2045. This initiative towards 100 Smart Cities is a collaboration between the Ministry of Communication and Information, the Ministry of Home Affairs, the Ministry of PUPR, Bappenas, and the Presidential Staff Office. The aim is to assist districts/cities in preparing Smart City Masterplans so that they can maximize the use of technology, both in improving public services and accelerating the development of potential in each region, (Wahyudi et al., 2022) A leader who wants to advance his city will certainly do:

Developing a focused vision: A leader needs to have a strategic perspective regarding the use of technology to improve the welfare of people in urban areas (Harahap & Choerudin, 2024). Encouraging cooperation between sectors: Cooperation between government, business and society is an important factor in the success of a city's transition to a smart city. A leader needs to be able to create synergy between the various parties involved (Wahyudi et al., 2022). Promoting innovation: Transformative leadership plays a role in encouraging the creation of innovative solutions, such as smart traffic management systems or the use of renewable energy, to increase the operational efficiency of cities (Ardinata et al., 2022). Implementation of the smart city concept faces various complex and diverse challenges.

4. RESULTS AND DISCUSSION

Smart cities are an approach to city development that combines information and communication technology (ICT) to improve efficiency, quality of life and sustainability. This concept not only emphasizes technological aspects, but also smart resource management, community involvement, and transparent governance. A city can be called "smart" when investments in human resources, social, and technological infrastructure can encourage sustainable economic growth and improve the quality of life of its residents. Several experts define smart cities in various ways. First, a smart city is a city that has a plan to improve its performance while reducing consumption and costs, and is committed to involving its citizens actively and efficiently with the help of advanced technology. Second, smart city is a vision

and mission to develop a city or district with the aim of integrating technology, including IoT, safely and effectively in managing the area (Ilhami, 2022). Developing smart cities have been able to identify enabler dimensions and components that make their implementation successful (Widiyastuti, ST., MT et al., 2021).

Here are some of the main challenges in creating *Smart Cities.* Digital technology is a change in the employee work system which no longer relies on a lot of manual human labor, but instead utilizes automatic and sophisticated systems operated by computers (Jamilati et al., 2023).

Resistance to Change: One of the biggest obstacles in realizing a smart city is resistance from various parties, including society, government and the private sector. Many individuals and groups may not fully understand the benefits advanced technology offers. This lack of understanding often leads to resistance to new innovations, which in turn hinders the process of transforming cities into smarter ones. Therefore, it is important to carry out effective outreach and education regarding the benefits and potential of technology in improving the quality of life. Lack of Human Resources and Technology: Smart city implementation requires significant investment in digital infrastructure, including hardware, software, and communications networks. However, not all cities have sufficient budgets to fund these projects. Apart from that, the lack of skilled human resources in the field of information and communication technology (ICT) is also an obstacle. To overcome this problem, collaboration between government, the private sector and educational institutions is essential to create relevant training and skills development programs. Data Privacy and Cybersecurity Issues: With the increasing use of technology and data collection, privacy and cybersecurity issues are becoming a major concern. City leaders must ensure that data collected from citizens is managed securely and not misused. This includes implementing strict policies regarding personal data protection as well as the use of encryption technology and advanced security systems. Apart from that, transparency in data management is also important to build public trust in smart city initiatives. Integration of Diverse Systems: Smart cities involve various systems and technologies that must be integrated with each other to function optimally. However, many cities face challenges in integrating existing systems with new technologies. This requires careful planning and collaboration between various stakeholders to create a harmonious ecosystem. Funding and Investment: Realizing a smart city requires a lot of investment. Many cities face difficulties in finding adequate funding sources, both from the central government, the private sector and international institutions. Therefore, it is important to develop innovative financing models, such as public-private partnerships (PPP) and the use

of financial technology (fintech) to support smart city projects. Community Involvement: Community involvement in the smart city planning and implementation process is very important. However, often the community is not actively involved, which can lead to dissatisfaction and resistance to proposed initiatives. Therefore, it is important to create platforms that allow community participation, such as discussion forums, surveys, and applications that allow citizens to provide input (Harahap & Choerudin, 2024). By understanding and addressing these challenges, cities can be more effective in realizing a sustainable and inclusive smart city vision, which will ultimately improve the quality of life of their citizens.

Examples of Smart Cities Implementation in the World: Since 2014, DKI Jakarta has introduced the Jakarta Smart City program which aims to integrate technology in city management. This program covers six pillars of smart cities, including smart governance and better living. Through this approach, Jakarta seeks to improve the quality of public services provided to its citizens. In addition, this program also emphasizes the importance of more efficient resource management. By utilizing technology, Jakarta hopes to create a better environment that is more responsive to community needs, thereby improving the overall quality of life (Rizki et al., 2024).

The Impact of Smart City on the Regional Economy. The application of the smart city concept has a big influence on the regional economy. Through the integration of modern technology and digital innovation, smart cities are able to create an environment that supports economic growth, increases efficiency, and encourages community involvement in economic activities. Here are some of the ways in which smart cities contribute to the local economy: Encouraging Innovation and Economic Growth, Smart cities provide an atmosphere that supports innovation and entrepreneurship. With advanced digital infrastructure, such as high-speed internet connections and the use of big data, these cities are able to attract investment from both within the country and abroad. Apart from that, the application of this technology opens up opportunities for startups and small and medium enterprises (MSMEs) to grow. For example, programs such as Jakpreneur in Jakarta play a role in helping local MSMEs to increase their competitiveness through training and access to digital markets (Wahyudi et al., 2022).

Supporting Local Entrepreneurship and the Digital Economy, Smart cities often exploit the potential of the local economy to create new job opportunities. For example, the City of Bandar Lampung has launched an online traditional market to improve the welfare of local

traders. This initiative not only expands market access for traders, but also increases their productivity by utilizing digital technology (Yusuf et al., n.d.).

Empowering MSMEs and Small Traders, In Madiun City, the implementation of the smart city concept has had a beneficial impact on street vendors in the city center. With the increasing number of visitors, both from local communities and outside the region, thanks to better city management, the income of small traders has increased significantly. This shows that smart cities can function as a driver for the economic growth of small communities (Putri et al., 2021).

Smart city applications also play a role in helping governments to be more responsive to the current situation in the areas they manage. Smartphone-based applications that can be accessed by many people have the main benefit of simplifying the process of conveying information. The existence of this application is increasingly useful because it is equipped with the ability to access the internet and various other digital media (Rafi & Santoso, 2023).

There are several indicators or supporting factors in realizing a smart city, namely:

a. Smart Economy (Smart Economy)—qualities that produce innovation and are able to face competition. New business opportunities and capital market competition will increase along with increased innovation and new innovations. A smart city that has a good economy, effective use of resources and natural potential. One way to measure the level of development in a region over a certain period of time is economic growth, which can increase the income and welfare of society as a whole.
b. Smart Mobility (Smart Mobility) is the ability to improve the city infrastructure planning system by building transportation and development infrastructure. Future city infrastructure management will be an integrated management system that focuses on the public interest.
c. Smart environment (smart environment)—sustainability and resources—means an environment that can provide comfort, resource consumption, physical and non-physical beauty, both visual and non-visual, for society and the general public. A clean and orderly environment is an example of implementing a smart environment (Hasibuan & Sulaiman, 2019).

Apart from that, there are also factors that encourage and weaken the implementation of Smart City from each enabling component, namely the presence of smart cities in cities and districts. Leadership, understanding, vision and mission, and strategic plans are signs of driving strategic goals. One thing to note is that strategic intent does not always focus on technology, although it cannot be separated from that. Best practices in research locations

show that leaders who focus on understanding technology transfer rather than understanding regional potential, regional problems, and the benefits of Smart City strategies for the region are more profitable than leaders who focus on understanding technology transfer. In addition, available e-Government infrastructure is encouraging the development of Smart Cities. It seems that government service electronicization policies are encouraging local governments to improve their governance, which has an impact on their ability to accept new technologies for public services. Therefore, it is not wrong if the Smart City policy is followed by a national policy that strengthens and forces local governments to implement community-oriented governance (Widiyastuti, ST., MT, 2019).

5. CONCLUSION

This study thoroughly discusses the role of leadership in creating a sustainable and technology-based smart city. It was emphasized that smart cities are not just about the application of technology, but also include efficient resource management, community participation and transparent governance. A smart city is defined as a city that has a plan to improve its performance while reducing consumption and costs, and is committed to actively and efficiently involving its citizens with the support of cutting-edge technology. Next, this article explains how transformational leadership can be a key factor in driving smart city implementation. Transformational leadership is defined as the ability to encourage collaboration, innovation and human resource development. In the context of smart cities, transformational leaders must be able to formulate a clear vision, encourage collaboration between sectors, and facilitate innovation.

This article also identifies various challenges faced in building smart cities in Indonesia, including: Resistance to change: Many individuals and groups do not fully understand the benefits of technology and tend to reject new innovations. Lack of human and technological resources: Smart city implementation requires huge investments in digital infrastructure and skilled workforce. Data privacy and cybersecurity issues: The increasing use of technology and data collection requires serious attention to privacy and security. Integration of diverse systems: Smart cities involve various systems and technologies that need to be interconnected. Funding and investment: Making a smart city a reality requires significant investment. Community involvement: Community participation in smart city planning and implementation is very important.

This article also discusses solutions to overcome these challenges, such as providing education and outreach to the public, developing training and skills improvement programs,

implementing strict policies regarding personal data protection, and encouraging collaboration between the government, the private sector and educational institutions. In addition, developing innovative financing models and creating platforms for community participation are also a focus. Examples of smart city implementation in Indonesia, such as the Jakarta Smart City, the launch of an online traditional market in Bandar Lampung, increasing the income of street vendors in Madiun, and the selection of Kupang as one of the cities for smart city development, are also highlighted in this article. Finally, this article concludes that the application of the smart city concept has a positive impact on the regional economy, such as encouraging innovation and economic growth, supporting local entrepreneurship and the digital economy, empowering MSMEs and small traders, and helping governments to be more responsive to current conditions in the areas they manage. Overall, this article emphasizes that smart city development is a complex process and requires strong commitment from all relevant parties. Collaboration between government, the private sector and society, as well as the right investment, is the key to success in creating a sustainable and inclusive smart city.

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REFERENCE

Ardinata, R. P., Rahmat, H. K., Andres, F. S., & Waryono, W. (2022). Kepemimpinan transformasional sebagai solusi pengembangan konsep smart city menuju era society 5.0: Sebuah kajian literatur [Transformational leadership as a solution for the development of the smart city concept in the Society era: A literature review]. Al-Ihtiram: Multidisciplinary Journal of Counseling and Social Research, 1(1), 33–44. https://doi.org/10.59027/alihtiram.v1i1.206

Fatahillah, I., Achmad Fauzi, T., Rambey, S., A. N., Maulana, F., Firda, M., Rinata, R., & Ramadhan, A. (2023). Analisis penerapan perilaku biaya terhadap profitabilitas UMKM di Indonesia. Jurnal Ekonomi Dan Manajemen, 2(3), 189–197. https://doi.org/10.56127/jekma.v2i3.1032

Harahap, M. A. K., & Choerudin, A. (2024). Leadership and transformation towards smart cities: Impact on innovation and business performance in the infrastructure sector. 2(2), 576–583.

Hasibuan, A., & Sulaiman, O. K. (2019). Smart city, konsep kota cerdas sebagai alternatif penyelesaian masalah perkotaan kabupaten/kota, di kota-kota besar provinsi Sumatera Utara. Buletin Utama Teknik, 14(2), 127–135. https://jurnal.uisu.ac.id/index.php/but/article/view/1097

Ilhami, D. A. S. (2022). Data privasi dan keamanan siber pada smart-city: Tinjauan literatur. Jurnal Sains, Nalar, Dan Aplikasi Teknologi Informasi, 2(1), 51–60. https://doi.org/10.20885/snati.v2i1.19

Izzuddin, F. N. (2022). Konsep smart city dalam pembangunan berkelanjutan. Citizen: Jurnal Ilmiah Multidisiplin Indonesia, 2(3), 376–382. https://doi.org/10.53866/jimi.v2i3.96

Jamilati, N., Anshori, M. I., & Salsabila, S. N. (2023). Penggunaan teknologi digital untuk meningkatkan kinerja pengelola pariwisata berkelanjutan studi kasus di Kabupaten Bangkalan. Innovative: Journal of Social Science Research, 3(6), 154–169.

José, R., & Rodrigues, H. (2024). A review on key innovation challenges for smart city initiatives. Smart Cities, 7(1), 141–162. https://doi.org/10.3390/smartcities7010006

Ledoh, L. Y. (2019). Analisa kesiapan kota pintar (Studi kasus pemerintah Kota Kupang). Jurnal Inovasi Kebijakan, 4(2), 1–15. https://doi.org/10.37182/jik.v2i4.40

Maulana, A., & Haerah, K. (2021). Smart city development innovation strategy and challenges for the government of Jember Regency. IOP Conference Series: Earth and Environmental Science, 717(1). https://doi.org/10.1088/1755-1315/717/1/012008

Maulana, R. Y., Marjamat, U., & Subekti, D. (2025). Memacu transformasi digital melalui inisiatif smart cities di pemerintahan daerah Indonesia Agung Wicaksono. Abstrak, 35–46.

Naples, U. P., & Bisnis, D. (2025). Kota dan konsumsi perkotaan dalam transisi menuju keberlanjutan. 29–34.

Nikmah, W., Mukarromah, A., Widyansyah, D., & Anshori, M. I. (2023). Penggunaan teknologi dalam pengembangan SDM. Mutiara: Jurnal Penelitian Dan Karya Ilmiah, 1(5), 366–386.

Putri, R. R., Muchsin, S., & Sunariyanto. (2021). Dampak kebijakan pembangunan smart city pada perekonomian masyarakat (Studi kasus kesejahteraan pedagang kaki lima alun-alun Kota Madiun). Jurnal Respon Publik, 15(3), 19–24.

Rafi, R. M., & Santoso, N. (2023). Pengembangan aplikasi pendukung smart city pertanian berbasis mobile. Studi kasus: Pemerintah Kota Batu. Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer, 7(5), 2559–2567.

Rizki, A., Tasa, A., Fridayani, H. D., & Isnadi, Y. (2024). Implementation of the smart city concept in the dimensions of smart people, smart mobility, and smart governance for the realization of Jakarta smart city. 03002, 1–10.

Wahyudi, A. A., Widowati, Y. R., & Nugroho, A. A. (2022). Strategi implementasi smart city Kota Bandung. Jurnal Good Governance. https://doi.org/10.32834/gg.v18i1.460

Widiyastuti, S. T., & I. M. T. (2019). Tata kelola institusi, teknologi, dan manusia: Bagaimana pemerintah daerah menangani komponen smart city (Institutional, technology, and human governance: How local governments manage the smart city's components). Jurnal IPTEKKOM: Jurnal Ilmu Pengetahuan & Teknologi Informasi, 21(2), 93. https://doi.org/10.33164/iptekkom.21.2.2019.93-108

Widiyastuti, S. T., I. M. T., Nupikso, D., Putra, N. A., & Intanny, V. A. (2021). Smart sustainable city framework: Usulan model kota cerdas yang berkelanjutan dan integratif. Jurnal PIKOM (Penelitian Komunikasi Dan Pembangunan), 22(1), 13. https://doi.org/10.31346/jpikom.v22i1.3297

Yusuf, M., Purnama, I., & Pendahuluan, S. A. (n.d.). Menumbuhkan ekonomi lokal bukan seperti cendawan di musim hujan BAB III smart economy untuk penguatan ekonomi lokal kota Surakarta.