POSKO LEGNAS
Pusat Studi Konstitusi dan Legislasi Nasional

The Role of Humans in Creating a Smart City[*]

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10.15408/jlr.v3i3.20934

Abstract:

Every human being is born unique with their own talents and abilities. Therefore, every human being is unique. We cannot compare humans because every human being has its own weaknesses and weaknesses. Thus humans are social creatures who need each other to complement each other. If the talents and abilities that are owned can be channeled properly and correctly, it will create extraordinary innovations that can change mindsets and facilitate all human activities, including by creating Smart Home and Smart City. Of course, this cannot be separated from the development of science and technology in the current era of globalization. Thus, the role of the government is also expected to support this because it is an integrated system. Thus, to realize a smart city, it is necessary to have a system that is mutually integrated and supports each other, namely smart governance, smart society, smart life, smart economy, smart environment, and smart branding.

Keyword: Smart Home; Smart City; Development of Science and Technology

A. INTRODUCTION

Indonesia is the largest archipelagic country in Southeast Asia, with a population of more than 260 million people. Indonesia's natural resources are, without a question, extremely diverse. Of course, the effective utilization of these natural resources cannot be divorced from the critical role played by the quality of existing Human Resources and the support provided by the federal government. However, when it comes to urban planning and the use of science and technology, Indonesia still needs to work with other industrialized countries, particularly those in the Americas and Europe, to achieve success. China is one of the Asian countries that excel at city administration and Smart City implementation, and it is one of the best in the world at doing so. [2]

In Indonesia, Smart Cities have been implemented in a number of major cities, including Jakarta, Bandung, Surabaya, Semarang, Yogyakarta, Makassar, and Denpasar, as well as other smaller towns. Smart city concepts in Jakarta include, for example, online licensing, SIP for neighborhood assessment by residents, online citizen complaints, Silakip for monitoring the work of the City Government, and citizen communication through social media platforms such as Twitter and Facebook. Jakarta is a global leader in smart cities. When it comes to Surabaya, the implementation of a smart city includes concepts such as the concept of a traffic light that is controlled by Closed Circuit Television (CCTV) and Integrated Traffic System Management, where when the queue in front of the traffic light is long, the red light will automatically run longer. There are a number of Smart City initiatives being implemented in Semarang. These range from regional planning information systems to evaluation monitoring information, integrated online citizen reporting, public CCTV applications, and a building permit system that can be managed without having to visit a government office. It is possible to utilize the Makassar Smart Card application for government and payment system matters in Makassar, and the city is able to monitor traffic flow and ensure that the online parking payment system is functioning properly. It is possible to save money by utilizing the electrical system in Yogyakarta through the use of a smart grid that regulates power plants that utilize New Renewable Energy (EBT) and fossil energy so that customers may also manage their electricity use automatically according to their needs. For example, disaster management with emergency telephone number 112, flood monitoring, ATCS, Denpasar Public Complaints Online (Pro), Geographic Information System, and E-Sewaka Dharma are all synergized in one room in

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[2] Hudjolly, "Epistemologi Dalam Kebijakan Publik: Kajian Konsep Smart City di Indonesia", dalam Untirta Civic Education Journal, Vol. 2 No. 1, April 2017, Hal. 31-48.

Denpasar using Damamaya Denpasar Cyber Monitor with various smart city applications.[3]

The objective of this paper is to provide a comprehensive overview of the significance of humans in the development of a smart city as an integrated system through the application of science and technology.

B. METHODS

The research method employed is the library research method, which involves the collection of data through literature or research, with the research objectives being investigated through various library information sources and resources (scientific journals, books, encyclopedias, newspapers, magazines, and documents). This research is defined as research that critically examines the information, ideas, or conclusions included in a body of academic-oriented literature, as well as research that formulates theoretical and methodological contributions to a specific topic. Specifically, descriptive analysis was used in this study, which is a regular breakdown of the data that has been acquired, followed by an interpretation and explanation so that the reader may grasp it properly. The type of data that was used in this study was secondary information.

C. RESULTS AND DISCUSSION

1. Smart City Concept

The Smart City concept has been around since the 1980s. This arises because of the increasing population in urban areas, so that developed countries, especially European countries, implement Smart City by managing existing resources, especially the use of science and technology. The methods used in each country also differ from one another. According to Muliarto (2015), smart city is a way of connecting physical infrastructure, social infrastructure, and economic infrastructure in an area using ICT technology, which can integrate all elements in these aspects and make cities more efficient and livable.[4]

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[3] 7 Kota di Indonesia yang Mengaplikasikan Program Smart City, https://blog.gamatechno.com/7-kota-yang-mengaplikasikan-program-smart-city/, diakses tanggal 18 Februari 2021

[4] Muliarto, H. 2015. Konsep Smart City Smart Mobility. Bandung: Institut Teknologi Bandung.

Smart city concept according to Stephen Goldsmith (2014):[5] "a project to highlight local government efforts to use new technologies that connect breakthroughs in the use of big data analytics with community input to reshape the relationship between government and citizen".

Following the trend seen in developed countries, in order to improve government services and engagement with the public, the city has offered its data to developers outside of government and policymakers within city hall for use as raw material for their projects. It is utilizing computerized tools to plan the design of a new community that will be developed on the site of a long-abandoned steel industry as part of an effort to overhaul its city planning process. Then there's the fact that Chicago is finally fulfilling the "smart city" vision that has been a decade in the making. Sensors installed throughout the city will soon collect massive amounts of data that will be used to aid in research and development. Furthermore, the city administration is no longer content with simply providing some digital services. It now provides the tools that citizens require in order to create their own applications.[6]

Based on the quote above, it can be concluded that smart city is a local government activity and involves the community by using new technology using big data analysis.

The concept of a smart city (smart city) was originally created by the IBM company. Previously, various names were discussed by world experts with the name digital city or smart city. The main thing is. IBM's version, a smart city is a city whose instruments are interconnected and function intelligently. Smart city (smart city) is a smart city concept that helps the community in it by managing existing resources efficiently and providing appropriate information to the community/institution in carrying out their activities or anticipating unexpected events beforehand. The concept of a smart city in general includes:[7]

1. A city that performs well with a view to economics, people, governance, mobility and the environment.
2. A city that controls and integrates all infrastructure.
3. Smart cities can connect physical infrastructure, IT infrastructure, social infrastructure, and business infrastructure to increase city intelligence.

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[5] Insani, Priskadini April,"Mewujudkan Kota Responsif Melalui Smart City", dalam PUBLISIA (Jurnal Ilmu Administrasi Publik), Vol 2, No. 1, April 2017, Hal 28

[6] Insani, Priskadini April,"Mewujudkan Kota Responsif Melalui Smart City", dalam PUBLISIA (Jurnal Ilmu Administrasi Publik), Vol 2, No. 1, April 2017, Hal 28

[7] Smart City, Definisi dan Pengertian, https://dpu.kulonprogokab.go.id/detil/68/smart-city-definisi-dan-pengertian, diakses tanggal 18 Februari 2021

4. Smart Cities make cities more efficient and livable.

The use of smart computing to create a smart city and its facilities are interconnected and efficient.[8]

a. Smart economy

The economy is one of the foundations that supports a region, a city, or a whole country. The economic management of a region should be improved, and it should be done using computers. The implementation and evaluation of smart cities in the part (dimension) of the smart economy is comprised of two components, namely the innovation process and the competitiveness of the city. These two factors are beneficial in producing a better and wiser nation's economic improvement since innovation and competitiveness are the most important assets for the advancement of the nation and the expansion of resource development opportunities. Growing access, equity, relevance, and quality of basic social services, improving the quality and competitiveness of a region's workforce, limiting the number and rate of population growth, and increasing community participation are all ways to influence the direction of resource development in a region.

b. Smart people

Capital is constantly required for development, including economic capital (also known as financial capital), human capital (also known as human capital), and social capital (also known as social capital) (social capital). Smart people, it might be said, are the most important aim that must be achieved in order to realize the vision of a smart city. In this part, you can find criteria for the human creative process as well as criteria for social capital. The following are the evaluation criteria, which include the following points:[9]

1. The existence of formal education levels in the form of schools and colleges that are evenly distributed throughout the community and that are based on information technology, such as the implementation of e-learning, the utilization of school/college information systems, learning with computer facilities, providing internet access for information sources/discussing learning, and others.

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[8] Repository UIN Suska dalam http://repository.uin-suska.ac.id/2858/3/BAB%20II.pdf , diakses tanggal 18 Febrauri 2021

[9] Repository UIN Suska dalam http://repository.uin-suska.ac.id/2858/3/BAB%20II.pdf , diakses tanggal 18 Febrauri 2021

2. The existence of the IT community and other communities related to the use of information technology.

3. The role of the community in the use of information technology.

c. Smart governance

Smart governance is a part or dimension of a smart city that specializes in governance. The existence of cooperation between the government and the community is expected to realize clean, honest, fair, and democratic governance and governance, as well as better quality and quantity of public services. Smart governance consists of three parts as follows:[10]

1. Community participation in direct and online decision-making.

2. Increasing the number and quality of public services. Smart city implementation, in this case utilizing information technology, can be done by providing web and mobile-based information systems for public services (making ID cards, driving licenses, etc.), providing effective, time-saving, and automatic financial/payment administration services (payments). electricity, water, etc.), and the existence of a structured and well-organized database in the storage of data and information related to public services.

3. There is transparency within the government, so that the public becomes aware and intelligent.

d. Smart Mobility

Specifically, smart mobility is a component or dimension of a smart city that focuses on transportation and community transportation. In this smart mobility process, there is a smart transportation and mobility process, and it is hoped that public transportation services and better mobility will be developed, as well as the elimination of common transportation problems like as traffic jams, traffic violations, pollution, and others.

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[10] Repository UIN Suska dalam http://repository.uin-suska.ac.id/2858/3/BAB%20II.pdf , diakses tanggal 18 Febrauri 2021

e. Smart Environment

A smart city's Smart Environment division is tasked with figuring out how to make the city's surrounding environment as smart as possible. Continuity of the process and improved management of resources are two of the criterion used in this evaluation. Sensor networks and wireless sensor networks, computer networks, artificial intelligence, database systems, mobile computing, operating systems, parallel computing, recognition (face recognition, image recognition), image processing, intelligent transportation system, and various other technologies related to environmental management and human beings are all necessary to achieve a smart environment.[11]

f. Smart Living

In smart living there are terms and criteria as well as goals for a better and smarter process of managing the quality of life and culture. To realize smart living, there are three sub-sections that must be met, including the following:[12]

1. Providing free and healthy internet services (free from pornographic content, violence, through a filtering/proxy system) and CCTV installation in public spaces and traffic to reduce the frequency of crimes in the community.

2. The use of information technology, such as a geographic information system for mapping the location of tourist attractions, the process of ordering admission tickets and hotel rooms online and mobile, to provide facilities, infrastructure, and information related to the potential of regional tourism.

3. The availability of adequate information technology infrastructure, so that all public facilities and services can run smoothly with the assistance of computerization and information technology, such as the availability of public computers in public places, the availability of an adequate internet network, and the availability of competent information technology and human resource personnel.

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[11] Repository UIN Suska dalam http://repository.uin-suska.ac.id/2858/3/BAB%20II.pdf , diakses tanggal 18 Febrauri 2021

[12] Repository UIN Suska dalam http://repository.uin-suska.ac.id/2858/3/BAB%20II.pdf , diakses tanggal 18 Febrauri 2021

Smart City Indicator[13]

Dimension	Working Area	Indicator
Smart Environment	Smart Buildings	Sustainability-certified Buildings
		Smart homes
	Resources Management	Energy
		Carbon Footprint
		quality
		Waste Generation
		Water consumption
	Sustainable Urban Planning	Climate resilience planning
		Density
		Green Space per capita
Smart Mobility	Efficient Transport	Clean-energy Transport
	Multi-modal Access	Public Transport
	Technology Infrastructure	Smart cards
		Access to real-time information
Smart Government	Online services	Online Procedures
		Electronic Benefits Payments
	Infrastructure	WiFi Coverage
		Broadband coverage
		Sensor Coverage
		Integrated health + safety operations
	Open Government	Open Data
		Open Apps
		Privacy
Smart Economy	Entrepreneurship & Innovation	New startups

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[13] Cohen, B, 2014. The smartest cities in the world 2015.

		R+ D
		Employment levels
		Innovation
	Productivity	GRP per capita
	Local and Global	Exports
	Conexion	International Events Hold
Smart People	Inclusion	Internet-connected Households
		Smart phone penetration
		Civic engagement
	Education	Secondary Education
		University Graduates
	Creativity	Foreign-born immigrants
		Urban Living Lab
		Creative Industry Jobs
Smart Living	Culture and Well-being	Life Conditions
		Gini Index
		Quality of life ranking
		Investment in Culture
	Safety	Crime
		Smart Crime Prevention

Sources: Cohen, 2014

As a result, it is possible to conclude that a smart city is a system that is integrated. It is necessary to have support and correlation between the economy, human resources (community), government, transportation and mobility, the environment, and facilities/infrastructure in order to develop and implement a smart city strategy. As a result, in the age of globalization, it is essential to maintain an open mind to beneficial changes.

These indicators must be tailored to each competency and aptitude that exists in each country, with each potential being maximized to the greatest extent possible.

2. Application of Smart City in the World

Smart City is not a foreign word in developed countries. According to (Cohen B: 2012, 10 (ten) ranking countries in the world that implement Smart City are described as follows:[14]

1. **Vienna**. This came as a bit of a surprise to me, as going into the research I had not heard much about Vienna as a smart city. But Vienna was the only city that ranked in the top 10 in every category: innovation city (5), regional green city (4), quality of life (1), and digital governance (8). Vienna is establishing bold smart-city targets and tracking their progress to reach them, with programs like the Smart Energy Vision 2050, Roadmap 2020, and Action Plan 2012-2015. Vienna's planners are incorporating stakeholder consultation processes into the building and executing carbon reduction, transportation, and land-use planning changes in the hopes of making the city a major European player in smart city technologies.

2. **Toronto**. The highest-rated smart city in North America, Toronto also scores pretty well across the board. Recognizing its importance in the movement, IBM recently opened a Business Analytics Solutions Center in Toronto. Toronto is also an active member of the Clinton 40 (C40) megacities, which seek to transition to the low-carbon economy. The private sector in Toronto is collaborating too, creating a Smart Commute Toronto initiative in the hopes of increasing transit efficiency in the metro area. Toronto also recently began using natural gas from landfills to power the city's garbage trucks. That's smart closed-loop thinking.

3. **Paris**. As is typical of sustainability-related rankings, Europe fared well. Paris was highly rated in several categories including innovation (3), green cities in Europe (10), and digital governance (11). Paris was already on the world map for its highly successful bike-sharing program, Velib, and just last month, the mayor launched a similar model for small EVs called Autolib, which currently has 250 rental stations.

4. **New York**. New York scored higher than most other cities in the ranking in all of the categories outside of quality of life, where it

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[14] Cohen, Boyd, "The Top 10 Smart Cities On The Planet" dalam https://www.fastcompany.com/90186037/the-top-10-smart-cities-on-the-planet , diakses tanggal 18 Februari 2021

ranked a miserable 47th. New York partnered with IBM in 2009 to launch the IBM Business Analytics Solution Center to address "the growing demand for the complex capabilities needed to build smarter cities and help clients optimize all manner of business processes and business decisions." In New York, IBM is already helping the city prevent fires and protect first responders as well as identify questionable tax refund claims–a move that is expected to save the city about $100 million over a five-year period.

5. **London**. The UK capital also scored relatively high across the board. London has been well-recognized for some of its sustainability innovations (i.e. congestion tax) and its robust transit system. The city will soon be home to the Smart Cities research center housed at Imperial College, which will leverage transport, government, business, academic, and consumer data in hopes of making the city more efficient and innovative. Just the other day, London announced a partnership with O2 to launch the largest free Wi-Fi network in Europe.

6. **Tokyo.** Tokyo is the first Asian city on this list, scoring well in the innovation (22) and digital city (15) categories. Last year, the city announced plans to create a smart town in the suburbs. In partnership with Panasonic, Accenture, and Tokyo Gas (among others), the eco-burb will contain homes that integrate solar panels, storage batteries, and energy-efficient appliances all connected to a smart grid. Tokyo is also focused on promoting smart mobility solutions.

7. **Berlin**. Berlin also performs well across the board, with good scores in innovation (14), green-ness (8th in Europe), and quality of life (17). In collaboration with Vattenfall, BMW, and others, Berlin is testing out vehicle-to-grid (V2G) technologies in the hopes of creating a virtual power plant from electric vehicles.

8. **Copenhagen**. Lately, it seems Copenhagen has been doing a lot right. It was rated number one on the green scale in Europe by Siemens and also achieved number one ranking in my global resilient cities ranking last year. All with good reason: Copenhagen is taking a real leadership role on sustainable innovation. The city has committed to carbon neutrality by 2025 and 40% of its citizens regularly commute via bicycle. Furthermore, I was quite impressed with the way their mayor, Frank Jensen, recently articulated the role of cities as growth engines

and the potential to stimulate the economy through cleantech innovation.

9. **Hong Kong**. Hong Kong scored quite well in key areas, including the digital governance ranking (3). However, its quality-of-life score (70) dropped the city down to ninth in my ranking of smart cities. Hong Kong is experimenting with RFID technology in its airport, as well as throughout the agriculture supply chain. The city has also been a leader in the use and adoption of smart cards, which are already used by millions of residents for services like public transit, library access, building access, shopping, and car parks.

10. **Barcelona**. Barcelona was recently ranked the number two smart city in Spain in the IDC report, and with good reason. The city is a pioneer in smart city and low-carbon solutions. It was among the first in the world to introduce a solar thermal ordinance about a decade ago, recently launched the LIVE EV project to promote the adoption of EVs and charging infrastructure, and the city also recently announced a major partnership to develop a living lab for smart-city innovation.

As a result, the implementation of Smart Cities differs from country to country depending on the needs and resources available in that country. Despite the differences, the goal of implementing Smart City is to improve the efficiency of city management, with the most important goal being to enable human activities and the transmission of information so that existing data is integrated and valid.

3. Utilization of Information Systems in Smart City

The role of the internet of things (IoT) in realizing the smart city concept is very vital. IoT devices are capable of sending information and performing follow-up over the network with minimal human intervention, so they can perform various functions automatically. According to Solution Architect Ericsson Indonesia, Hilman Halim, the operation of IoT devices only requires three main elements, namely:[15]

1. Physical device,

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[15] Nurzaman, Adam Fahsyah,"Mengetahui Elemen Utama dalam IoT" dalam https://sis.binus.ac.id/2019/08/21/mengetahui-elemen-utama-dalam-iot/ diakses tanggal 19 Februari 2021

2. Internet network, and

3. Application.

If these three elements are met, then a number of devices can be customized according to user needs. The implementation of IoT in realizing a smart city can be diverse, limited only by the imagination and abilities of the developers. Hilman mentions five examples of IoT applications that are commonly encountered in the smart city concept these days:[16]

- Smart lighting. Not only can it be applied to street lighting, but also to traffic lights. "With smart lighting, it can be monitored which lamps are damaged. It can also be turned off or on remotely," explained Hilman when met at the 2018 Selular Congress event.

- Smart parking. This solution can be used by residents to make it easier to find a parking space. Users can pre-book a parking space before arriving at the location. In Indonesia, there are several startups that provide solutions like this, such as Smark Parking and Parking.

- Waste management. The volume of waste in a shelter can be monitored remotely. The cleaners don't need to go to the trash cans one by one to check them.

- Connected manhole. This solution is useful for monitoring the temperature of underground culverts. Because these culverts not only function as water channels, but also to store cables and gas pipelines.

- Smart electricity. Electricity service providers can find out directly the user's electricity consumption data without having to send officers to check on the spot.

Thus, it can be concluded that every existing development requires the latest information systems and technology. Technological developments take place very quickly.

5. Constraints to Implementing Smart City

Data and information from the transportation sector, public health, and energy management are all connected in a system, allowing the data and

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[16] Apa Itu Smart City dan Tantangan Penerapannya di Indonesia dalam https://mediacenter.singkawangkota.go.id/apa-itu-smart-city-dan-tantangan-penerapannya-di-indonesia/ diakses tanggal 19 Februari 2021

information to be analyzed, and then provided to the community as a whole, which is the goal of the Internet of Things in smart cities. The implementation of Smart City, on the other hand, met a number of difficulties during its early stages.

The Director, Regional Sales Organization at Intel Asia Pacific Japan (APJ), Phillip Cronin, says that "a smart city as an implementation of the Internet of Things is not something that can be realized quickly." "The availability of financial and technological resources is actually one of the major roadblocks to the implementation of smart cities. On the other hand, this cannot be ruled out because the most crucial element to consider is the local government's intention to create a smart city." As a result, the development of Smart Cities can be accomplished in phases.[17]

D. CONCLUSION

In light of the outcomes of the discussion that has been detailed, it is possible to conclude that the deployment of Smart City is intended to provide convenience for the general population. In this instance, there must be a connection established between the government and the community through the use of science and information technology that is utilized maximally in an accurate and timely manner. The Smart City is built on six pillars, all of which must be networked and interdependent on one another. Among these are the following six (6) pillars: smart environment, smart mobility, smart government, smart economy, smart people, and smart living. Globalization has created a situation where smart cities are desperately needed. This can be a good measure of a country's ability to use science and technology to its problems. As a result, individuals play an extremely vital role in the realization of Smart Cities. It is an extremely important characteristic of Human Resources to be competent and professional, as well as receptive to the advancement of science and technology.

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[17] detikInet, Apa Hambatan Penerapan Smart City dalam https://inet.detik.com/cyberlife/d-2668629/apa-hambatan-penerapan-smart-city diakses tanggal 19 Februari 2021

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