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The Strategy Smart City Development Concepts in Indonesia

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A B S T R A C T

The government ability to manage the potencies and assets owned through digital technology is the key to developing a smart city. Standardization of public services procedur through ISO is the early stage in digitalizing the government services. This paper focuses on analyzing the implementation of the smart city concept in Indonesia and identifying the relevant, innovative strategies applied as a reflection of the transformation of urban areas. This paper aims to determine the effectiveness of digital public service facilities in improving the community's welfare. The paper employed a qualitative approach with a case study. The data gathered from journal articles, e-books, official government data and websites, the latest online news portals, and the data of relevant others agencies. The results show that the smart city concept development initiative in several cities and districts in Indonesia is increasing, in line with information and communication technology. Accordingly, the smart city strategy developed relies on ICT-in public services. Therefore, the processes require massive campaigns for the community to get used to it. In addition, having good communication and collaboration among all stakeholders in society creates a dynamic of sustainable urban development framed in smart city project design applied.

INTRODUCTION

A city has double roles as the center of economic growth and urbanization magnet. This role can be seen in a city's position in goods and services distribution that gets bigger year to year. which is also a point of economic growth, continues to grow, and evolves in line with increasingly diverse needs. Sullivan oversees the city as a geographical area with a high population, while the availability of area is relatively small. The city has scarce resources and gradual population growth that needs a system to fulfill the city's resident's needs. A shortage of resources and lack of facility mostly faced by urban management in Indonesia. The level of population migration triggers socio-economic problems that arise due to urbanization. Migration of population from rural to urban areas is due to greater job opportunities in urban areas even though jobs are in the non-formal sector (Widyastuti et al., 2017). The increasing number of urbanizing with limited skills and working in the non-formal sector causes several problems such as unemployment, poverty, slum areas, pollution, garbage, and environmental damage in the long term. Therefore, the City Government development programs must resolve the negative impact of urbanization (Mulyani & Dkk, 2021).

The industrialization has several consequences that can be measured through forwarding and backward linkage. The urbanization process is created through a shift in the function of land use, from the agricultural function to the function of providing goods and services. This shift in function is a consequence of the pattern of community activities that require economic efficiency and intensive distribution of goods and services. Arthur Lewis (2003) points out that excess labor in the agricultural sector triggers a surplus of workers so that the urban industrial sector can absorb it without losing output. This trend has a strong correlation with population movement from rural areas to cities, so that it will directly trigger the growth of industrialization. The industrial sector is expected to maximize its role as an initiator of progress in other sectors (Widyastuti et al., 2017).

The position of industrialization as an instrument of growth influences human settlement patterns. The pattern originally concentrated in small areas or spread following the agricultural area has now shifted to a pattern focused on cities, from small towns to big cities. Simultaneously, the city eventually gave birth to a city system with a hierarchy in which large-scale activities would be concentrated in the metropolitan city. This reality is in line with Magvirah Andira Selang, et al (2018) postulate that developed based on their research at several villages located on the suburbs of the Yogyakarta Urban Area. They found land changes with the highest spatial urbanization rate of 37.77% in the Bimomartani Village during 2012-2016 (Selang et al., 2018).

Dynamic urban design is required to face and solve the eroded carrying capacity of the environment. Urban areas are characterized as areas with the highest intensity of goods and public services distribution. Through the 2020 Population Survey (SP2020), the Central Statistics Agency stated that Indonesian populations were 270.2 million people. And they are dominated by 27.94% of the Z generation and 25.87%millennial generations. In the long term, rapid population growth impacts land-use change (Triana, 2021). This kind of impact consistently creates potential mischances along with massive economic activities.

Indonesian Population Projection (PPN, 2018) predicts around 66.6 percent of Indonesian will migrate to urban areas in 2035. What is more, The National Development Planning Agency (2018) predicts that the percentage of the urban population in 2045 will reach 67% of the total population of

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Indonesia (PPN, 2018). Those two predictions are still under the Ministry of Environment and Forestry (2019) forecast, which states that 82.37% of Indonesia's population in 2045 is live in cities (Kehutanan, 2019). The rapid population growth will have negative consequences unless managed wisely and decisively.

Van Der Hoff and Steinberg (1992) mention a sustainable approach in cities development. A development approach that can regulate the sustainability of nature resources without excessively exploiting it so that it can secure the community economic sustainability from time to time (Makarova & dkk, 2019). Furthermore, sustainable urban development with an increasingly intense level of socio-economic activity in the long term changes the ecological balance resulting from urban transformation accompanied by the industrial revolution (Cohen, 2018). This means that urban development sustainably relies on economic strengthening and considering aspects of environmental sustainability in urban areas.

The socio-economic balance order is the milestone of the city sustainability development process. A creative and innovative urban resident has a significant role in improving the quality of life towards prosperity. The smart city empirical framework is built based on the creativity and innovation of its citizens in interacting with each other. Various opportunities to explore insights with their capacities are supporting variables (Visvizi & Lytras, 2019). In addition, Smart City is also understood as a set of linked elements that consistently facilitates the exchange system information with unlimited time implementation between various sub-systems to improve people's living standards (Mora & Deakin, 2019). In short, Smart city designs are directly connected with advances in information and communication technology (ICT) and the prospect of implementing tools and applications that have been developed effectively in urban spaces. The interdependence of various aspects of the city's function has become the main focus to build a conceptual pillar for a smart city.

Recently, smart city research has focused on strengthening ideas that allow for additional income in the form of value for urban communities through new services with ICT improvements. Including the public service responsiveness frames various considerations that compositely affect the policy-making process. The offer of open data and services aimed at fulfilling the rights of citizens should indeed be present as a solution to solve the negative effects of city growth through the integration of innovative infrastructure with intelligent management systems.

Cape Town is one of the many examples of countries adopting Internet of Things (IoT) opportunities for urban development. Although countries in Africa often get the nickname as primitive and left behind, Cape Town has succeeded in proving that the optimization of resources accompanied by the use of technology can trigger a real breakthrough regarding connectivity.

In 2014, Cape Town developed the "Where is My Transport?" App, so that residents can access information on rates and frequencies of transportation modes (IoTSecurityWatch, 2020). Another smart solution offered was when the water crisis hit parts of Cape Town. The sensor placement in the city center is specifically designed to alert residents to a water leak and ensure that the daily water quota is met in real-time.

Modernity awareness and a sustainable lifestyle are the driving motivation for smart city development in Indonesia. The movement towards 100 smart cities has shown that a joint program organized by the Ministry involved 100 regencies/cities spread across Indonesia (Rizkinaswara, 2020). Several cities that have successfully operated ICT platforms for public services and transportation have Jakarta, Bandung, Yogyakarta, Boyolali, Surabaya, and others (Ismaniah & Lestari, 2021). The success of the smart city concept according to (Pramesti et al., 2020) is reflected through the mobility of society or organizations with a high educational background in mobilizing activities in all aspects as a form of support for the government.

The high enthusiasm of hundreds of cities that have started pioneering the smart city concept in Indonesia is the indicator of the success of sustainable development agenda in 2030 (The 2030 Agenda for Sustainable Development / SDGs). Sustainable Development Goals are developed through a bottom-up process and a consultative management system aimed at being universal and comprehensive in the scope of social, economic, and environmental aspects (Walker et al., 2019). The design of SDGs in catalyzing action in critical areas can be in the form of implementation that demands urgency in dealing with environmental degradation, climate change, poverty, hunger and other socio-economic conflicts that surround humanity and the earth (Kakar et al., 2022).

The sustainable development transformation identify through the reviving the development of strategic cities. The urgency of the involvement of the main actors implies that the technological aspects of smart cities require in-depth scientific exploration along with the cutting edge technological (Cook & Nair, 2021). Along with (Silva et al., 2018) postulate that revealing the data accessibility, availability, and interoperability linked to programs between devices determines the speed of smart city recognition. The knowledge gap among the community and unequal fiscal capacity obstructs the smart city development process. The minimal budget portion of IT development is an example of the handicap in developing smart cities.

According to (Handayani et al., 2021), the government's vision and mission not synchronized with development policies often trigger public doubts. In contrast, public support is a significant social capital supporting city infrastructure development. In addition, (Nuraeni & Suharto, 2020) observed the role of governance assessment tools in controlling the suitability of information technology investments based on the readiness level of smart cities. The disparity development among regions in Indonesia is also determining the success of smart city concept development. Therefore, this research analyzes Indonesia's development strategies related to smart cities. The final goal of writing is to determine how far the use of information and communication technology (ICT) is applied to preparing smart city sketches.

METHOD

This research employs a qualitative approach with a case study method. The qualitative approach assists in capturing social phenomena in community accurately through a descriptive elaboration (Mardawani, 2020). A case study approach is able to focus on one case in detail and intensively.

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The data collection techniques were obtained through a literature study approach. The resources to support this writing are reading materials and scientific journal articles, e-books, anthology, government publications, press releases, official government web pages, and the latest news pages. In addition, Webinar material organized by the Director-General of Regional Autonomy and the DKI Jakarta Provincial Communication, Informatics & Statistics Agency also becomes a source of data. The webinar was conducted on May 19 2020.

The data analysis process begins with identifying secondary data that has become a reference so that the data display results are in the form of tables to facilitate the delivery of clear and systematic information to the reader. The analysis obtained through reading, listening, accessing, and recording activities will produce a combination of information related to the various implementations of the smart city concept in Indonesia, complete with the constituent components and implementation strategies.

RESULTS AND DISCUSSION

Introduction to the ICT-based Smart City Concept in Indonesia

Technological innovation has actually been adopted for more than two decades by several countries in the Asia-Pacific region. Singapore and South Korea have succeeded in proving their existence in realizing smart city initiatives with various national and local policy products since the early 2000s. The smart city idea has successfully attracted the interest of several other countries to dive into the high-tech business through the use of the Internet of Things (IoT) and Multicloud as a form of digital infrastructure at affordable rates.

Singapore is a significant pioneer of the whole-of-government (WHOG) concept capable of delivering new technology performance in overall management and application in city-states. The development of the WHOG concept focuses on the practical and careful use of urban data to provide multi-agency collaboration within the government. The Singapore Land Authority (SLA) plays a role in maintaining accurate data for building, land, and vegetation infrastructure (Anthopoulos, 2017). Reliable 2D and 3D data allows different government agencies to correct city policies or future scenarios so that productivity improvements, decent housing, and efforts to minimize environmental impacts can be achieved. Another amazing investment came in Autonomous Vehicles (AVs). This clever finding has succeeded in placing Singapore as a world leader in providing technology, policymakers, and infrastructure for autonomous vehicles.

Another example that should be a mirror in creating smart city ideas is South Korea. Not much different from Singapore, the incorporation of ICT-based infrastructure has been implemented by South Korea to increase competitiveness to create a quality of life in urban areas. South Korea's approach capabilities can play a fundamental role in implementing several smart city projects, including "Sejong Smart City" and "Busan Eco-Delta City," as shown in Figure 1.

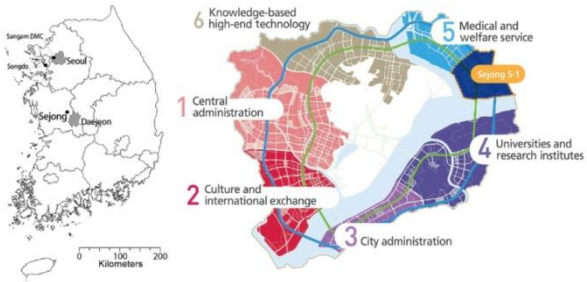

FIG. 4.3 A location of Sejong *(left)* and the layout of the Sejong New Town *(right)*.

Figure 1. Location of Sejong (left) and Sejong New Town (right)
Source: *Smart Cities for Technological and Social Innovation (e-books)*

Sejong is a new city with an area of 73Km2 followed by a target population of 500,000 by 2030. The collaboration between cutting-edge technology with strengthening public services and economic knowledge has made Sejong Smart City ogled as a picture of a city with intelligent mobility and smart technology to support the Sejong 5-1 Neighborhood Pilot Project. The evaluation of the smart city initiative in Sejong is clearly illustrated through the renewable energy development facilities in Sejong's public buildings. Virtual Power Plants (VPP) also campaigns for the "zero-energy" movement by considering the economic impact, urban stability, and key actors' role in facing the following global challenges.

Full implementation of ICT can be started with the implementation of standards as a guide to start managing the smart city concept. The multi-approach based on international standards then provides at least three options: adapting ISO provisions, modifying ISO, or creating your unique standard. ISO compiled a preliminary report (ISO 2014b) intended to define smart cities and introduce standardization. Sustainable community development can be achieved by realizing standard indicators (ISO 371 Series). Indonesia has adopted SNI ISO 37120:2018 as an indicator to build optimal quality of life and urban services, SNI ISO 37122:2019 as an indicator of a smart city, and SNI ISO 37123 as an indicator of a resilient city. The following are some implementations of the smart city concept framework that has been successfully developed by a number of cities/districts in Indonesia.

Jakarta Smart City (JSC)

As the Indonesian Capital, Jakarta implements smart city development through six services programs organized at once. In responding to the community's needs, the DKI Jakarta Provincial Government, through "Jakarta Smart City 4.0" identifies problems that the public often complains about (JSC, 2021). Those problems are dense settlements, congestion, public transportation, pollution, garbage, parking lots, green open land, clean water shortage, medical and local government services, education, unemployment, and flooding.

The six aspects that become the reference for the success of a smart city include smart economy, smart governance, smart mobility, smart living, smart environment, and smart people. The framework for "Jakarta Smart City 4.0" implies that the essential role between the government as a collaborator and the inventors will determine the direction of the smart city design that has been prepared. Utilization of Big Data, Cloud, Artificial Intelligence (AI), Blockchain, and Internet of Things (IoT) as ICT products will facilitate collaboration between academic

colleagues, industry, private companies, investors, and the involvement of governments outside the region.

The development of digital technology, which used to be challenging to develop, has now become increasingly encouraged since the arrival of the pandemic (Williams, 2020). The utility of information technology in countering new branches of consequences due to the pandemic is directly proven through the comprehensive steps in the concept of "Jakarta Smart City: Responding to Covid-19" (NASIONAL, 2021). The context of implementing the smart city concept in Jakarta focuses on strengthening the health and education sectors through 4 flagship programs currently being implemented.

The corona.jakarta.go.id website is the main page that provides information on the development of COVID-19 cases in Jakarta. Clear data transparency can be obtained through the infographic page and official documents released by the DKI Jakarta Provincial Government. In addition, the wider community can access the presentation of data visualization in maps and graphs to facilitate the understanding of residents. The DKI Jakarta Provincial Health Office has also validated the data update successfully designed by the Jakarta Smart City data team. Residents can also independently diagnose symptoms that refer to COVID-19 by asking qualitative questions.

JAKI (Jakarta Kini) operates as an application-based information center, which the DKI Jakarta Provincial Government officially launched by integrating various public services. The public has widely used ICT applications in various government services in Jakarta. Until 2020, JAKI users reach 105,000, the majority of which are used by government partners to continue the socialization of digital services. JAKI users can also file complaints about individuals who violate the rules for implementing the PSBB. The following is presented in Figure 2 regarding the Jakarta Kini (JAKI) Platform application.

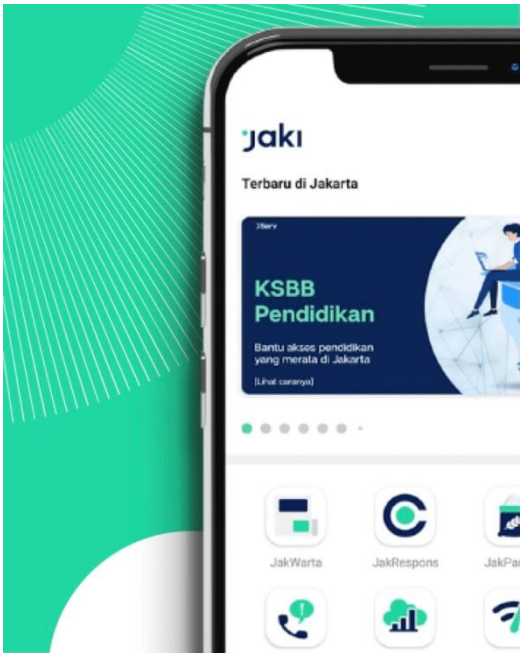

Figure 2. Jakarta Kini (JAKI) *Platform*

All-access to up-to-date information can be found on the corona.jakarta.go.id, JakWisata, JakPangan, JakLapor, Start-Up Collaboration Access, and the Push-Notification feature. The Large-Scale Social Collaboration Program (KSBB) is a digital platform that functions as a forum for distributing aid for residents affected by COVID-19. The participation of prospective collaborators in the success of the #BantuSesama program can be done by donating at certain locations based on a map of the location of residents who need assistance. Donors can also obtain information on the ongoing KSBB program cooperation.

Bandung Smart City

The Bandung Smart City is a city that ideally functions in managing the potential of city resources efficiently and effectively to solve a series of city problems and challenges. The creation of a solution supported by a solid infrastructure and agile human resources will undoubtedly improve the standard of living of the citizens of Bandung towards a #Liveable and #Loveable city. This realization is in line with the study results by Miraeki Herawati and Achmad Djunaedi (2020), that the availability of data with a fairly good level of integration in Surakarta City can support the implementation of smart cities. The seriousness of the City Government in providing a more credible development infrastructure can be achieved through careful data management (Herawati & Djunaedi, 2020). The Bandung Smart City cluster is divided into several clusters, including smart governance, smart economy, smart branding, smart society, smart living, smart city evaluation, smart environment, smart district, smart college, exhibition, BANDUNG ICONIC (Innovation, Creativity, & Coaching Clinic), Start-Up Bandung, and the Bandung City MSME Forum (*BANDUNG SMART CITY*, 2021). This multiple grouping unexpectedly outperformed Dubai–Los Angeles in the TOP 50 Smart City Government Rankings, which the Eden Strategy Institute announced on March 31, 2021.

The biggest achievement of Bandung City in being ranked 28th in the world is certainly inseparable from the solid participation between city elements in applying the smart city concept after the economic impact recovery due to Covid-19 (W. Putra, 2021). The push for optimal implementation can be reflected directly by adopting digital channels in all Regional Apparatus Organizations. The Online Single Submission (OSS) system is also continuously promoted as a licensing service application that focuses on equal distribution of internet network access to the smallest scope in the community.

Jogja Smart City

The government in the city of Yogyakarta uses a supporting application called 'Smart Province Jogja Istimewa' to create a smart & livable Yogyakarta city. Officially launched on June 7, 2018, Jogja Smart City adopts the concept of Single Windows, Single ID, and Single Sign-On (A. O. Putra, 2021). People outside the Yogyakarta area can even access the 'Jogja Istimewa' application for those who want to explore information about tourist locations and other needs freely and comfortably.

Another advantage highlighted by the smart city concept in Yogyakarta is the Jogja Bike application. The presence of Jogja Bike aims to pamper the tourists who want to get around the city of Yogyakarta while pedaling a bicycle. The special specifications in the bike become a different priority for development in creativity. As a result, the Ministry of Communication and Information Technology has awarded the

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"Smart City Award" to two applications, Jogja Smart Service and Jogja Bike, with the hope that the city of Yogyakarta will always present its best performance in providing excellent service to the community (News, 2018).

Surabaya Smart City

Embedded in the slogan "Surabaya Light of Java", the city's readiness of Surabaya in welcome the smart city era has been started since the leadership of Bambang Dwi Hartanto until it moved to Mrs. Tri Rismaharini (Tashia, 2018). The primary motivation of the city of Surabaya in implementing a smart city is not merely to win various awards but rather to focus on building intelligent communities accompanied by complete public services (Fandeli & Muhamad, 2021). At least six concept breakthroughs open the gates of success as a smart city role model, as shown in table 1.

Table 1. Implementation of the Smart City Concept in Surabaya

No.	Category	Program
1	*Smart Governance*	The Electronic Procurement Service (LPSE) is based on the e-Procurement application, which Ibu Risma first developed as a digital-based government system service.
2	*Smart Economy*	'Pahlawan Ekonomi' and 'Pejuang Muda' which was popularized since 2012. The aim is to motivate young people and homemakers to sharpen their creativity through entrepreneurship activities.
3	*Smart Environment*	The renovation of the Surabaya Zoo (KBS) area, the Surabaya Early Warning System (SEAR) disaster management system, waste management into a new product, and the ITS-ATSC intelligent transportation system.
4	*Smart Living*	Dolly localization closure.
5	*Smart Mobility*	The Mayor of Surabaya likes to hold impromptu inspections to ensure road conditions and public facilities are maintained.
6	*Smart People*	Ibu Risma succeeded in realizing 'Rumah Bahasa' program, which was facilitated free of charge and located at the Surabaya City Youth Hall. The two programs offered consist of training in language and computer science classes with mentors from foreign linguists.

Source: The data is processed from liputan6.com (09/11/2021)

The Smart Economy of the city of Surabaya is also encouraged through the holding of the Surabaya Smart City (SSC) competition event every year (Wijaya & Ginanjar, 2019). A total of 150 RWs in Surabaya are enthusiastic about competing for innovation in favoring their MSME products. For example; One of the Penjaringan Sari Village residents has herbal products, catfish ponds built on abandoned reservoirs, and briquettes. Those products are the main product of MSE in Penjaringan. Not only that, MSMEs in Penjaringan Sari were acknowledged as the first MSMEs that were established during the pandemic. The resident's enthusiasm for establishing and managing MSMEs is one aspect of generating the smart economy as one of the Surabaya Smart City vision and missions. In the future, Eri Cahyadi, as the Mayor of Surabaya, confirmed his promise to empower MSMEs in the Wisma Penjaringan Sari (WPS) area by synergizing between MSME actors and investors (Baihaqi, 2020). In line with the research results of W P Tyas et al. (2018), Indonesia's success in using the internet for home-based businesses (Home-based Enterprises / HBEs) can provide various benefits for the expansion of small businesses in Indonesia (Tyas et al., 2019). The Surabaya Smart City concept won an award in 2011 organized by Warta Ekonomi magazine for the categories of smart living, smart environment, and smart government dimensions (Enam, 2019).

Denpasar Smart City

The product managed and owned by Denpasar is the PRODenpasar+. An application that builds a base on a real-time community aspiration service system. The various features displayed include informative features, market price features, licensing features, Damakesmas features (health services), Denpasar Sightseeing (tourism), and Denpasar City Tour. Meanwhile, residents can also easily report things that disturb the order and environmental security to obtain information related to natural disasters. Another uniqueness of the Denpasar City Online Public Service Application is the availability of the Disability Portal feature as a medium of conversation between groups of people with disabilities and the general public (Balipost.com, 2019).

Semarang Smart City

The smart city concept that is only oriented towards strengthening digitalization will not catch up with advanced countries. The Semarang City Government emphasized that the smart city concept focused on providing excellent and effective services is more beneficial for the wider community. The plan to turn a number of city parks into smart parks has succeeded in providing an automatic watering system. Public complaints can be handled quickly through the Lapor Hendi application. The latest innovation applies a robotic system with a unique design to welcome guests. After successfully collaborating with Diponegoro University, the design was initiated as a solution to reduce the potential for the spread of Covid-19 on the public agenda (Zafira, 2021). On the other hand, 10,693 CCTVs were successfully installed by the Semarang City Communication and Information Office, with details of 10,293 being RT CCTV and some belonging to corporations that were integrated into the Semarang City Government.

The determination to implement the smart city aspect in Indonesia has been ongoing since the Government of Indonesia set the target of 100 smart cities. Some of the follow-up programs expected to be more and more unlimited in existence are cashless payments for public transportation in Jakarta, the command center as a city monitoring system in Bandung, smart villages in Banyuwangi, and so on. Although the implementation has not yet reached the perfect word, the Indonesia Smart City Investment Forum and the 4th Indonesia Smart Nation Award 2020, entitled "Smart City 2020: Driving Innovation & Productivity During the Global Pandemic," managed to find seeds of new potential through a flagship program from each city/district. Sponsored by Telkom Indonesia, Smart City Nusantara, and Digital Village Smart

Village Nusantara, the following table shows the two regions that won the competition based on the available categories.

Table 2. Cities/Regencies that Received Appreciation at "The 4th Indonesia Smart Nation Award 2020."

Category	Regencies/City	Program Title
Smart Governance	Kota Balikpapan	Teknologi *Smart Card*
	Kab. Batang	Layanan *Drive Thru* di Mal Pelayanan Publik (MPP)
	Kab. Sragen	Pelayanan Administrasi Kependudukan (PANDU) berbasis *online*, Program PELANDUK (Pelayanan Antar Jemput Dokumen Adminduk),& SI ANTON (Sistem Antrian *Online*)
Smart Environment	Kota Padang Panjang	Pemanfaatan Serai Wangi
Smart Society	Kota Denpasar	Sistem Jaga Baya
	Kota Probolinggo	Perkuat Kampung Tangguh
	Kota Tegal	Program Pembelajaran *Local Loop*
	Kab. Banyuwangi	Teknologi Cek Bansos (Bantuan Sosial)
	Kab. Kendal	Layanan Kendal Pintar Berbagi
Smart Living	Kota Semarang	Aplikasi Trans Semarang
	Kota Tarakan	Utilisasi TCM (Tes Cepat Molekuler) Covid-19 yang Optimal
	Kab. Sleman	Gerakan Candak Mas Covid-19 (Cari & Kendali kan Masalah Covid- 19)
	Kab. Sintang	Protokol Transportasi Umum
	Kabupaten Musi Banyuasin	Penerapan Isolasi *Outdoor* Pasien Covid-19
	Kab. Halmahera Utara	Gerakan Salawaku (Sehat Langkah Awal Kuat)
	Kab. Bogor	Aplikasi Taman Sehat
	Kab. Bojonegoro	Gotong Royong Ksehatan
	Kab. Gunung Kidul	Proyek *I AM SAFE* (*Inclusive Access to Multisectoral Services and Assistance for Everyone*)
Smart Economy	Kota Batam	Aplikasi Bakulan (Belanja *Online* Sayuran, Buah, & Bumbu Dapur)
	Kota Gorontalo	Aplikasi *Patali Shopping Point* (PSP)
	Kab. Bantul	Platform Pasardesa.id
	Kab. Banyumas	Aplikasi Belanja Sayur *Online* (BECEER *ONLINE*) & Posko Penukaran Uang Steril
	Kab. Lamongan	Aplikasi Pasar *Online* Lamongan (POL)
	Kab. Lumajang	Aplikasi Belanja *Online* Bantu Ibu
	Kab. Pasuruan	Strategi Keluarga Berdaya Melawan Covid-19 (Kebal Covid-19)
	Kab. Pati	Perluas Batik Juwana Rambah
Smart Branding	Kota Pekalongan	Penerapan *Technopark* & Kuliner Siaga Candi
	Kota Pare-Pare	Penerapan *New Normal* pada Wisata Salo Karajae
	Kab. Blitar	Layanan INI BARU JOSS BANGET MAS (Izin Usaha dan Investasi Bisa dari Rumah Jemput *Online Single Submission* (OSS) Bersama Instansi Terkait Malam Hari Bisa)
	Kab. Trenggalek	Protokol Pengelolaan Wisata dengan Prinsip *Clean, Health, Safety* (CHS) dan *On Demand*

Source: The data is processed from the Instagram page @citiasiainc

Strategy for Utilizing Technology for Smart City Development in Indonesia

The integration of technological transformation creates an imaginary image of urban conditions in Indonesia in 2045. The expansion of the Internet of Things (IoT), sharpened by technological advances, makes the intelligence of cities in Indonesia increasingly limitless. Smarter cities are now not impossible to become a new image for cities in Indonesia.

The highlight of the results of the proprietary study (Pratama, 2021) states that there are at least three examples of scenario initiatives that may occur in Indonesian cities in the future, including:

a) Utilization of satellite imagery technology to assess urban development and land use in various developed countries. Increasingly affordable satellite imagery will direct the urban spatial planning process to real-time spatial data, with higher frequency accuracy, to traffic engineering efforts by observing human footprints and means of transportation.
b) Expansion of the practice of using 5G networks along with the use of drone technology in formulating city policies. On the other hand, sensor technology and cheaper internet speeds will make it easier for city authorities to monitor vehicles, to enforce detailed and comprehensive on-street and off-street parking policies.
c) Advanced road-pricing implementation. After being successfully applied in London, Stockholm, and Singapore, electronic road pricing technology has a positive effect on reducing congestion in the city.

Although the arrangement of the scheme above is only a glimpse of what will happen in the future, it does not cross the minds of the Indonesian people that the extent to which the benefits can be harvested in 2045 through various policies that

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are right on target to mitigation efforts that have been visible since now.

Innovative Strategy Scenario Towards Indonesia 2045

Essentially, the city's role as a motor of economic growth rests on achieving the target to immediately get out of the middle-income trap to realize the vision of Indonesia Gold 2045. In order to minimize the various negative impacts of externalities due to the sustainability of activities in the city, the demands for innovation for urban areas are believed to be able to capture benefit in terms of agglomeration as much as possible. The role of modern technology supported by more targeted city policies certainly positively impacts the community's quality of life.

The maturity level of management and urban planning is born as the primary key to the success of a smart city. Referring to the research results belonging to Al Jarah, dkk (2019) revealed that the minimal role of institutions triggered the weak urban management in Sulaymaniah, thus triggering the low level of policy implementation (Al Jarah et al., 2019). The growing availability of big data in urban areas requires a balance between leadership & governance aspects to play the function of digital technology as a critical enabler. The ownership of good city governance can ward off public concerns in the midst of changing the paradigm of a society that is interconnected.

Various aspects of planning to evaluate urban policies that are not transparently gradually diminish public confidence in city authorities. A good policy can only be formulated through a process of analyzing data and information by providing feedback by the community as the source. Therefore, synergy between institutions accompanied by increasing the capability of city authorities as well as efforts to approach the community needs to be the focus of attention in the future era. The active role of the city community becomes increasingly vital when stepping on the year 2045, when the internet network becomes a liaison for every condition.

Strengthening City Governance

ICT facilities and broadband infrastructure accumulated in investment and providing a technology base is a key strategy to win the city of the future. Efficient decision-making can be achieved through an integrated operations center that combines city traffic management, public space CCTV, and security and provides real-time city-data. "*The Future City Glasgow Program*" has a new way to engage citizens in informing urban redesign policies and services. FCGP has committed to building partnerships, SMEs, companies with the latest methods in data analysis needs. The legacy of FCGP is officially handed over to Glasgow City Council (GCC) to deliver a transformation program that is a core player in the development of smart cities in Scotland. The 8th city is the Scottish Cities Alliance's effort to create a virtual city focusing on "technology" and "data" themes.

Several recent studies have shown that about two-thirds of cities in Central America are maximizing technology under the smart city label. The technology has been widely successful in delivering several US cities in the Global Smart City ranking with a collection of best strategic practices, which include: 1.) smart parking tools, traffic management, and autonomous vehicles, 2. real-time public transport tracking applications, 3.) intelligent utility intervention, 4.) e-governance applications, 5.) intelligent innovation for energy efficiency in buildings, and so on. A number of city points in the United States are starting to develop multisectoral programs with various cross-policy approaches that are often piloted for citywide adoption. The installation of 9 integrated projects in the West End area as a historical place in the city aims to create a "testing ground" for smart city technology to improve the quality of life.

Building a Fortress of Technological Sensitivity

A city can be indicated as paralyzed if technological interference often attacks the sensitivity of the urban system. A solid mitigation system needs to be put in place by the city authorities to prevent the interruption of internet access, GPS signals, etc. Various solutions offered, such as the speed of the backup system in performing recovery, decentralization of the internet system, to increasing cybersecurity (digital security) should be reserved to ward off technological stagnation in urban areas. In line with RG Guntur Alam and Huda Ibrahim (2019) research results, cyber security has become an essential issue in smart cities in Indonesia. Various proposals related to cybersecurity strategies would like to highlight the urgency of policy planners, makers, and technical implementers to create a guide related to cybersecurity issues in implementing smart city projects (Alam & Ibrahim, 2019).

The smart city pilot program in New York has successfully deployed districts with hundreds of sensors and technologies that have previously passed tests. Data accumulation program services have assisted efficient waste collection and management activities. Not only that, New York is presenting contactless technology, WiFi capacity, and online charging stations as a replacement for phone booths (EARTH.ORG, 2021). The Big Apple's largest service has overcome efforts to reduce exhaust emissions and traffic congestion. To boost local creativity, New York holds an annual contest for those who can create a city open data application with attractive prizes in the form of large amounts of cash.

Employment and Education Direction Reform

In addition to promising a myriad of benefits in a new chapter of city life, technology has also shifted some old jobs to be abandoned. The public's anxiety peaked when they found out that the number of jobs offered was not proportional to the declining number of workers replaced by machines. The increasingly inflamed social challenges among the public have made the government think swiftly by adapting to the employment and education systems. The workforce's output needs to be equipped with increased skills that are relevant to technological developments. Education policies also need to be reviewed to stimulate creative and adaptive thinking patterns to technological advances.

Vietnam's unique smart city concept carries the concept of revitalizing traditional villages through mural painting with community-stay development and social media. Economic development in rural areas has lost focus after the urbanization process. In general, the dynamics of the growth of a village will falter as a consequence of the migration of workers to big cities. However, new approaches have been discovered thanks to the role of external actors and ICTs. Tam Ky City in Quang Ngai Province is one of the cities that applies a cooperative approach to integrating remote villages with the help of domestic actors. Through social media connectivity, the small fishing village in Tam Thanh generates new innovative designs initiated by local

authorities, academics, volunteers, active workers, and international institutions.

In line with home-stay service provider sites in Hanoi's Old Quarter, residents of Tam Thanh also optimize the functionality of the web by participating in advertising their "community-stay" services (Yigitcanlar et al., 2021). The results of research conducted by Rini Rachmawati (2018) revealed that the development of smart villages needs to be supported through the adoption of information and communication technology (ICT). The maturity of the concept design based on clear guidelines and guidelines can facilitate developing smart districts and smart villages (Rachmawati, 2018). The active role of residents in maintaining a waste-free village is also accompanied by efforts to improve the quality of roads and public spaces and donate hundreds of new boats for decorative purposes and collectively beautifying their home environment. This proves that the serious commitment of the people of Tam Thanh in introducing local products and tourism services has now become a new light for the face of the village, which was once dim.

Stavanger is located on the southwest side of Norway, close to discovering the first oil fields belonging to the Statoil company and other international oil companies. With a total population of 144,147 in 2021, the majority practice professions supported by the petroleum industry (Citypopulation.de, 2021). So the Stavanger smart city strategy aims to fill the gaps (gaps) neglected by the decline in the oil and gas sector. For example, a rebrand centered on improving the energy efficiency of older residential supplies and accentuating smart mobility solutions with the main goal of introducing electric transport and accessibility. The realization of the smart city project in Stavanger does not involve the search for new technological solutions but rather leads to adaptation through known technology. Instead, it is hoped that there will be a gradual improvement from the development of pre-existing projects through integrating various activities and local actors under a typical smart city framework.

Intensification of Urban Policy Instruments

The characteristics of technology that always grow faster than policy development is a challenge for city authorities to create accurate and targeted policy regulations. The symptom of technological disruption is marked by the Autonomous Vehicle (AV) as a substitute for conventional cars. In addition, the spread of ride-hailing apps & services can have implications for increasing density which attracts the potential for urban sprawl in urban areas. However, in transforming into a smart nation, Singapore seeks to maximize the potential of artificial intelligence (AI), data utilization, and ICT to build a superior community. A sustainable investment that puts the community as a top priority motivates Singapore to continue to drive the country's growth.

Given the population of 670,000, the Norwegian capital is targeting electric cars and plans for all vehicles in the city by 2025. Enforcement of zero-emission car incentives includes free parking, bus lanes, taxation, and lower prices. The toll road has begun to be implemented as a determining factor for Oslo's success in becoming a carbon-neutral city in 2050. This statement is by the research results by Anastasia Widya Kristen and Widyono Soetjipto (2019) that CO2 emissions will decrease along with the continuation of modernization, which requires low-carbon energy (Kristiani & Soetjipto, 2019).

Strengthening urban policy instruments can be implemented by reflecting on the practice of developed countries based on evidence-based research. Combining federal funding with public funding made the implementation of electric vehicles in Columbus successful. The US Government has been offering tax credits for electric vehicles and plug-in hybrids of up to $7,500 since 2010. Funding for the development of 375 vehicle charging stations was based on a Smart City Challenge grant and a $10 million incentive offer from across the state of Ohio during 2018–2019. By 2020, as many as 1000 vehicle charging stations have been established in 6 districts around Columbus. In addition, Smart Columbus also successfully held a roadshow titled "ride & drive" with a plan for promoting 12 electric cars. Strong collaboration with local car dealers is their approach to smooth the certification development process. In 2018, electric vehicle sales surpassed 1.25% of all vehicle types. This percentage achievement soared compared to sales results in 2016, which only amounted to 0.36% of the total.

Road pricing policies are predicted to be easier to implement in urban areas. Several other policy instruments such as the application of parking levies, vehicle taxes, public housing incentives, and public transportation investments, are considered very important to anticipate the adverse effects of congestion.

Sparking Social Innovation

City functions can run well if driven by technological and social innovation. The creation of high levels of productivity, livability, sustainability, and various platforms, is a manifestation of the merging of technology with the ability to spark new ideas. When the actors welcome the smart city discourse, the discursive shift allows a city to explore existing socio-material practices. In contrast to technology, social innovation emphasizes adapting norms, values, and behavior to achieve desired conditions.

Cape Town, which is the capital of South Africa, has recently inherited the traces of apartheid at the urban level. Exceptions at the socio-spatial level based on racial lines are a phenomenon that continues to emerge in Cape Town (Alizadeh, 2021). The prosperous suburbs that act as economic centers are now racially dividing, giving rise to a form of policy that is very unfair. The black population of South Africa, most of whom are poor, ultimately chooses to stay away from the center of livelihood. Access to basic services or assets cannot be reached equally. Serious implications for infrastructure result in high operating costs for city management.

Cape Town has been successfully involved in strategic planning processes to extinguish the fires of growing challenges over the past few years, including the City Development Strategy (CDS) and the Spatial Development Framework (SDF). Both schemes were formally approved by the Council and Mayor's Committee in 2012. The CDS-SDF policy specifically positions densification at the center of Cape Town's urban planning and development vision. An inclusive and dynamic urban development process can be characterized by an informal settlement environment that is socio-economically integrated in an imaginary metropolitan spatial.

Although much different from previous social phenomena, the rampant conflict in Indonesia is identical to the range of access to public services and where the residents live, in 2011,

 https://doi.org/10.35308/jpp.v8i1.4468

Hitachi contributed by supplying ATM machines and helping with the recycling of shabby cash in 2013. Until now, Hitachi has always pledged itself to help develop social innovation through the use of Big data and AI by IT experts and reliable operations technology. The latest report informs that until 2021, as many as 25% of Indonesia's population already has a digital account. Reporting from the katadata page, this percentage is the second largest in the world after Brazil.

CONCLUSION

The results of the analysis in the research show that the acceleration of digitalization efforts has succeeded in encouraging the implementation of the smart city concept in Indonesia. The development of smart cities in 5 big cities and several other cities has succeeded in realizing the availability of application-based information centers through strategic achievements, including 1.) creating innovative programs by utilizing ICT products with the involvement of academia, industry, government at local and national levels, communities or community organizations that comprehensively play an important role in ICT applications for the creation of a sustainable urban environment, 2.) supporting application inventions to provide optimal services for the public, such as the OSS system and the integration of other data available in real-time, and 3.) strengthening the synergy between MSME actors with the City Government through the use of online platforms for business expansion purposes.

In the end, public effectiveness can only be felt if a strategy can fulfill three social dimensions, namely the provision of various technology-based social platforms, the emergence of positive externalities as an effort to accelerate the exchange of information, and increasing the welfare of life because the community already has control over the environment.

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