

A Gap Analysis of Yogyakarta Smart City Project (within the Dimension of Smart Governance and Smart Economy)

Ray Ferza^{1*}, Melati Ayuning Pranasari¹, Suci Emilia Fitri¹, Dian Martha Indarti¹, Tedi Gunawan¹

¹National Research and Innovation Agency Republic Indonesia

*Corresponding Author: rayferza@gmail.com

Received: 7 December 2022, Revised: March 9 2022, Accepted: March 15 2022

Abstract: *The COVID 19 Pandemic exposed digitalization as a fundamental aspect to revive the local economy. Fortunately, Indonesia has already shifted towards a 100 Smart City for their Municipalities since 2017. Yogyakarta as one of the best SC, has suffered the impact of pandemic. In the need to explore the phenomenon of how a municipal SC project align the concept in order to survive the pandemic impact, it will be relevant to describe a gap analysis on (1) Yogyakarta SC Project through the dimensions of SG and SE and (2) Strategic Solutions. This paper employed a gap analysis through a qualitative study and it uncovered gaps of the SC project such as central government intervention, sectoral quality of digitalization, and intergovernmental sync. The strategy to eclipse the Cohen SC Wheel are the followings: reinforcing the regulatory capacity, improving the app business process and features, and intensify the formal cooperation, be it inter-governmentally or between public-private.*

Keywords: *Smart City; Pandemic; Digitalization; E-Government*

Introduction

The scholarly agreement on definitive boundaries that articulate Smart City (SC) ends up in general norms. For example, one of the debates is whether SC is only related to information and communication technologies (ICT) in building cities or whether ICT is only one of the supplements that can accelerate urban development in the SC corridor. Albino et al. (2015, p. 10) have stated that the role of ICT in SC is essential, namely as a community introduction within SC and to increase the transparency of city governance.

Therefore, various definitions of SC have been formulated and characterized

as the following: (1) a city that has a network infrastructure, as well as enables the creation of efficiency in political and social processes and cultural development; (2) an emphasis on urban development business leadership and creative activities for growth support; (3) social inclusion of various social capitals in urban development; and (4) the natural environment as a strategic component for the future. In some SC performance metric studies, Cohen's SC Wheel is the most commonly used to analyze SC (Calzada, 2017; Gao, Wang, & Gu, 2020; Loo & Tang, 2019; Monzón, López-Lambas, Velázquez, & Fernández, 2015; Peek & Troxler, 2014).

The SC Wheel could be interpreted as a tool to benchmark the world's major cities, consisting of six dimensions (Peek & Troxler, 2014, p. 156). Each part of SC can be shown by these things about urban life (Lombardi, Giordano, Farouh, & Yousef, 2012, pp. 139–144).

Smart Economy → Industry

Smart People → Education

Smart Governance → E-democracy

Smart Mobility → Logistics and Infrastructure

Smart Environment → Efficiency and Sustainability

Smart Living → Security and Quality

As a fundamental aspect in the context of development digitalization, the intensity of SC's contribution is becoming increasingly relevant, especially amid the COVID-19 pandemic. As an example, the technology contained in smart healthcare and smart delivery systems in urban utilities has provided technology without physical contact to minimize the risk of infection. The relevance of SC and the digital world in the pandemic era has also opened up new opportunities for the development of the digital economy that is believed to be able to answer the economic impact of the pandemic (Jiang, 2020; Sharifi, Khavarian-Garmsir, & Kummitha, 2021).

At this point, the digital economy has become a certainty that every sector of business must pursue. Moreover, SC has landed in 100 districts/cities at the regional level, but there are not enough local governments that encourage Micro, Small and Medium Enterprises (MSMEs) in their area to enter e-commerce. In fact, until March 2021, only around 13% of MSMEs integrated their business with

digital technology, regardless of whether SC has been implemented since 2017 (Novika, 2021). When it comes to digital economy exposure, the MSME sector is the least developed when compared to higher levels of business. According to Damuri, Yose, et al, (2020, p. 21), the digital economy in the form of e-commerce is a platform that must be adopted as soon as possible in order to connect producers and consumers of MSME goods and services. At the national level, the Ministry of Cooperatives and MSMEs has implemented various programs involving several local marketplaces. At the regional level, Yogyakarta Municipal is a best practice in MSMEs' developmental policy (Winata, 2016). Furthermore, Yogyakarta has operated an SC project since 2018.

From before the COVID-19 pandemic, studies on Yogyakarta SC have been conducted from the beginning of its formation. Astrid et al., (2020, p. 21) have reviewed that the Jogjakarta Smart Service (JSS) application, as a Yogyakarta SC application, contributes significantly to the improvement of performance expectancy, effort expectancy, social influence, and behavior intention since 2018. The JSS application has started its operations quite well, even though it has not been able to satisfy the user-friendliness needs of the disabled user segmentation. Furthermore, the use of JSS was not optimal in terms of socialization (Gumilar, 2019, pp. 25–26). Another positive achievement of the JSS application was also expressed by Fauzi & Setiawan, (2020, p. 14) who revealed that the application of JSS has fulfilled the principle of accountability within the framework of good governance. The achievement of

accountability from this application can be seen in business processes that create opportunities for realizing accountability of procedures, regulations, policies, and programs. While Anggraini & Iqbal (2020, p. 158) have assessed that JSS has been well prepared based on the e-readiness approach, because JSS emerged from local regulation that contains aspects, such as the availability of supporting infrastructure and regional budget allocation. The only inadequate element is the human resources issue with

information technology expertise. JSS has also worked very effectively by achieving a number of completed monthly reports that exceeded the number of unfollowed-up reports throughout 2019 (Novriando, 2020, pp. 72–74). Furthermore, digital applications have become an existential object in assessing the intensity of implementation with the dimensions contained in the SC concept in the COVID-19 pre-pandemic international study on SC assessment (Monzón et al., 2015, p. 7).

Table 1 Cohen's SC Wheel and Its Dimensions

| Smart Governance | Smart Economy | Smart Mobility | Smart Environment | Smart People | Smart Living |
|---|----------------------------------|------------------------------|--|--|------------------------------|
| Participation | Innovation | Traffic Management | Network and Environment Monitoring | Digital Education | Tourism |
| Transparency and Information Accesibility | Entrepreneurship | Public Transport | Energy Efficiency | Creativity | Culture and Leisure |
| Public and Social Services | Local and Global Interconnection | ICT Infrastructure | Urban Planning and Urban Refurbishment | ICT-Enabled Working | Healthcare |
| Multi-level Governance | Productivity | Logistics | Smart Building and Building Innovation | Community building and Urban Life Management | Security |
| | Flexibility of Labor Market | Accesibility | Resources Management | Inclusive Society | Technology Accesibility |
| | | Clean, non-motorised options | Environmental Protection | | Welfare and Social Inclusion |
| | | Multimodality | | | Public Spaces Management |

Source: ASCIMER - Assessment Methodology for Smart City Projects: Application to the Mediterranean Region, (Monzón et al., 2015)

In order to create research space from the previous studies, In this paper, the discussion will be more encapsulated on the conformity of the Yogyakarta SC

Project *vis-a-vis* the SC conceptual basis (gap analysis) within the dimensions of SG and SE. Both dimensions are considered essential to address the issues related to

the governance of the digital economy at the urban level. The urgency of the economic performance of The urban sector in the era of the COVID-19 pandemic is becoming intense. SG is seen as a pivot point in supporting the development of SE, which covers the urban economy. Besides, SG can be interpreted as the intensive involvement of various stakeholders in policy making and public services that rely on e-governance as the main foundation of the whole process (Albino et al., 2015, p. 12). Then, SE is an urban economy whose business sector is strengthened by innovation and productivity to adapt to the needs of the MSME market and workers, in order to develop new business models that have the resilience to globalization while being able to compete locally and globally (Monzón et al., 2015, p. 5).

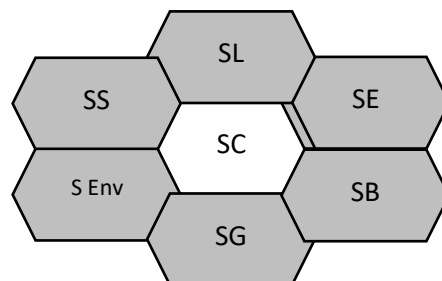
Brief of Yogyakarta’s Smart City Project

Yogyakarta Municipality initiated the development of Smart City (SC) through the Municipality's information technology vision stipulated in Mayor Regulation No. 15 of 2015 on E-Government. Based on the regulations, the Yogyakarta Municipality aims to improve the performance of public

services with the support of an integrated information technology system. Since the municipality already enacted an E-Government Policy in 2015, the city of Yogyakarta has initiated the implementation of SC, which is devoted to the dimensions of Smart Governance (SG). Furthermore, the performance of regional policies towards SC has also been outlined in the regulation as a milestone in the fifth year achievement of e-government development.

In 2016, discourse on the movement of 100 cities towards SC began to take place at the local government level, so that the Yogyakarta Municipality prepares SC policies incrementally. In 2018, the Yogyakarta Municipality participated as part of Indonesia's 100 SC Movement, after making preparations in the previous three years. The Yogyakarta Municipality legitimized the participation by setting the direction of SC development in a Mayor's Regulation No. 100 of 2018 on the SC Development Masterplan of Yogyakarta Municipality 2018–2022. Based on the regulation, the six areas in which Smart Governance (SG), Smart Branding (SB), Smart Economy (SE), Smart Living (SL), Smart Society (SS), and Smart Environment (S Env) are all very clear.

Figure 1 Six Dimensions of Yogyakarta SC



Source: Mayor's Regulation No. 100 of 2018 on the SC Development Masterplan of Yogyakarta Municipality 2018-2022.

Reinforcement of SC policy in the city of Yogyakarta continues through the derivative of Regulation No. 15 of 2015 on E-Government, namely the Yogyakarta Mayor's Decree No. 373 of 2018 on the Implementation of Jogja Smart Service (JSS). The mayor's decree became the legal basis for developing the Yogyakarta city service one-stop application, manifested in the Jogja smart service application. This application meets the public service needs of Yogyakarta residents, both internally and externally with the Yogyakarta Municipality.

After two years of the inauguration of JSS as the SC focal point, there was the COVID-19 pandemic in early 2020. It has made social distancing a compulsory protocol. The impact of social distancing is the increase of digital penetration, especially in the economic activity of the lower-middle class, most of which have not been touched by digital interventions. The *Bank Indonesia* Report shows that 87.5% of the micro, small and medium enterprises (MSMEs) sector is paralyzed by the COVID-19 pandemic. The sales side of MSME products is the most damaged, covering a proportion of 93.2% of the overall adverse effects as of December 2020 (Saputra, 2021). The city of Yogyakarta is one of the regions that closed 2020 with a regional gross domestic product slump of -2%. The city also suffered a hit from the COVID-19 pandemic in the MSME sector (Kusnandar, 2021). According to *Dekranasda* (Art and Craft Council) Yogyakarta, 70% of MSMEs who are members of *Dekranasda*

Yogyakarta have been affected by the COVID-19 pandemic (Rusqiyati, 2020).

Based on such problems as poor pandemic-resilience performance of urban MSMEs during the existence of JSS as the catalyst of the Yogyakarta SC Project, it will be relevant to conduct a descriptive study on the two dimensions of SG and SE, with a thorough analysis on (1) mapping the gaps and challenges of the Yogyakarta SC Project through the dimensions of SG and SE and (2) strategic solutions for strengthening the SC of Yogyakarta.

Methods

This study employs a qualitative approach with the descriptive method that emphasizes the phenomenon of intertwining the Yogyakarta SC Project with SC dimensions for the digitization of MSMEs in Yogyakarta. In order to describe the phenomenon, the perceptions of the related parties and various supporting documents in the governing process are used. Qualitative research methods demonstrate a different approach to scientific research than quantitative research methods. Qualitative methods rely on text and visual data (Creswell, 2014). At the data analysis stage, this method is unique in that it uses a gap analysis to explore gaps in relevant interpretations of SC project development and draw strategic solutions from them (Dawes, 2009, p. 299). The research was conducted during March-July 2021 by involving related parties from municipal and central government administrators, such as the three divisional heads of the

Telecommunication (Telco) Bureau of Yogyakarta Municipality, one Divisional Head of the Ministry of Telco, and one Deputy Assistant of the Ministry of Administrative and Bureaucratic Reform.

Result and Discussion

The Project of SC in The City of Yogyakarta

SC in the city of Yogyakarta has an ecosystem that can be divided into two government structures: central and regional, and one structure outside the government. The central structure of the SC Yogyakarta ecosystem can be spelled out as follows: The Central Government consists of the Ministry of Communication and Information as a technical coordinator in fostering and supervising information technology policy at the central level. The Ministry of Communication and Information ensures the implementation of SC in the region complies with technical regulations. The Ministry of Administrative and Bureaucratic Reform assists and supervises the implementation of SC in accordance with the implementation of the Electronic-Based Government System following Presidential Regulation No. 95 of 2018 on SPBE. The Ministry of Home Affairs as coordinator of development and supervision of SC implementation as a support system for urban area development.

At the local government level, SC of Yogyakarta focuses on the performance of the Municipal Agency of Telco (*Diskominfotik*) as a municipal bureau in the field of technology and informatics and as a coordinator to develop SC. In addition, specifically for the implementation of SC,

Yogyakarta Municipality also has an SC Implementation Team consisting of personnel from across regional institutions. Collaboration on elements outside the governance structure is also carried out in the development of SC. These elements include the private sector, which is incorporated into the SC Council and the SC Implementation Support Communication Forum. They are involved as providers of network infrastructure and information technology solutions.

In the development of SC Yogyakarta, the primary support departs from the collective commitment between the regional head leadership and the Municipal Legislators (*DPRD*) leadership. Based on such strong support, the fundamental ideas of SC Yogyakarta are outlined in the Mid-Term Municipal Strategic Plan (*RPJMD*) Regulation. Priority towards the SC of Yogyakarta is contained in one of the 12 points of mission on strengthening the city of Yogyakarta at the planning level. Moreover, SC content is derived from other chapters of the *RPJMD*.

Yogyakarta City SC Planning began with incorporating SC ideas into the planning document and is now focused on a Yogyakarta Mayor Regulation No. 100 of 2018 on Yogyakarta SC Development Masterplan 2018–2022. As a policy guideline and program preparation, this regulation aims to integrate each regional agency's activities within a vision of Yogyakarta's development through effective, efficient, transparent, accountable, and participatory services and is managed in an integrated and sustainable manner with technological support for community empowerment.

SG via JSS in Yogyakarta

Yogyakarta Municipality translates SG as intelligent government management and consists of public service, bureaucracy, and public policy. In detail, SG is elaborated upon in the description of SC goals and objectives. Here are the details: SG has the mission to realize good governance management and clean, effective, and efficient bureaucracy in integrated public services. When it comes to its development goals, SG is expected to increase transparency, accountability, and participation in implementing government and community services through revamped institutional systems and procedures that are in accordance with public needs and the utilization of integrated technology and information support. Departing from these goals, SG leads to several targets as follows: effective and efficient public services with indicators of success in the form of external and internal public service indexes of 80 to 81 by 2022; (2) efficient bureaucratic management with the achievement of success indicators in the form of performance accountability values in 2022; and (3) efficient public policy with success indicators in the form of a public service index from 80 to 81 in 2022.

At this time, SG Yogyakarta city, consisting of (1) Service 3 in 1 Birth Certificate, (2) JSS (so far has included 134 services and reinforced the concept of Single ID, Window, and Sign- On), and (3) Innovation: *Keluar Bersama Daftar 1 Dapat 5* +1 NIK, KK, KIA, Health Book, and Birth Certificate; *Serat Layon (Submit Death Certificate Upon Departure)*; Drive-

Thru Citizen Identification; *Mantul (Manten Anyar Entuk Telu (3in1 Marriage)*); Electronic Licensing Service / Online Single Submission; *Cek Poin Jogja (Investment Potential Checking)*. Among all these innovations, JSS is the flagship program of SG.

SE via JSS in Yogyakarta

Yogyakarta Municipality interprets SE as intelligent economic management and consists of various elements, among which are industry, welfare, and transaction. Specifically, SE is divided into the identification of SC goals and targets. SE includes the mission of realizing the restructuring of the industrial sector and the populist economy for the welfare and empowerment of the community by building a digital financial ecosystem towards a cashless society. As for the goal, SE was developed to increase business opportunities for small, micro, medium, and cooperative businesses by enhancing a digital financial ecosystem. Based on those goals, SE has the following objectives: (1) the establishment of a competitive industrial ecosystem with success indicators in lowering the Gini Ratio from 0.41 to 0.39; (2) the establishment of a financial transaction ecosystem with the achievement of success in the form of economic indicator growth from 5.16 to 5.23.

In the meantime, the development of the SE of Yogyakarta, consisting of (1) *Nglarisi*, which until April 2020 recorded transactions amounting to 1.5 billion rupiah, (2) QR Code Retribution: For strengthening digital transactions in Yogyakarta, the Yogyakarta Municipality

chose the involvement of Bank *BPD DIY* (the Provincial Bank) rather than state-owned banks such as BRI and BNI. This is to facilitate the flow of transactions and shorten the range of control to be under the guidance of local governments, (2) the *Dodolan* application that has been used by 200 SMEs, (3) online job exchanges that throughout 2020 have been accessed by 109,852 job seekers, and (4) innovation: Home Business Camp as an innovative model of new young entrepreneurs based on hobbies and mentoring needs of prospective new young entrepreneurs and collaboration of 23 traditional markets with *Gojek* through go-shop features in the *Gojek* application.

In the smart branding dimension, the Yogyakarta Municipality also developed the *Gandeng-Gendong* movement. *Gandeng-Gendong* is a form of collaboration between stakeholders to reinforce the potential of the region to improve the economy and community empowerment. Although this movement is registered in the Smart Branding dimension, the *Gandeng-Gendong* Movement aims to increase the participation and economic performance of the community so that it is fairly close to the mission inherent in the SE dimension. In 2019, the movement was able to create 9 out of 72 groups with a significant turnover surpassing the Yogyakarta Regional Minimum Wage and encourage the involvement of 9% of incorporated businesses as members of the Corporate Social Responsibility forum in Yogyakarta.

The Gaps: Central Government Intervention in the Implementation of Local Service Systems

On several occasions, the intervention of central government policies, such as the implementation of SIPD (Information System of Local Government) policy that accepts the Ministry of Home Affairs Regulation Number 70 of 2019 on SIPD and the Ministry of Home Affairs Number 77 of 2020 on Regional Financial Management and SPBE (Electronic-based Local Government) policy that is considered in Presidential Regulation 95 of 2018 on SPBE, is not supportive of an endogenous development in Yogyakarta's SC. Policy interventions from the central government tend to prioritize the acquisition of service systems rather than just data integration. In fact, for the Yogyakarta Municipality, the central government is supposedly acting as a data integrator. When it comes to service systems, the Yogyakarta Municipality developed the system many years earlier. Related to this, the implementation of SC dimensions should be based on implementing a digital twin strategy that includes the stages of adjustment such as pilot project, growing up a process, and scaling. These stages are useful as preconditions to ensure the implementation of SC dimensions does not interrupt the existing system but supports each other, integrates, and becomes a whole system (Petrova-Antonova & Ilieva, 2019, p.4).

In the case of SC of Yogyakarta, this problem intersects with the dimensions of SG. This is because SIPD policy through article 4 paragraph 2 of the Ministry of Home Affairs Number 70 of 2019 has constrained the SG information system of local developmental rooms that had

initially been run and integrated well in the Yogyakarta Municipality, such as e-musrenbang (civic forum for regional planning and development), e-planning, and e-budgeting. Then, other Central Government policies such as SPBE also constrained the SG information system of the local developmental room by the Yogyakarta Municipality. Therefore, the Yogyakarta Municipality must follow the service system produced by SPBE policy amid the JSS reporting system that Yogyakarta has been operating earlier, not to mention Upik, as a reporting information system of Yogyakarta since 2004, must be replaced with the LAPOR application derived from SPBE policy. In addition, Presidential Regulation No. 95 of 2018 on Electronic-Based Government Systems Articles 36 to 39 have limited the local government's initiative. This policy will extend the bureaucratic chain in the development of information systems, whereas it is contrary to the spirit of SC innovation, which supposedly does not recognize silos or hierarchical boundaries in its operationalization. In particular, the development of SC in urban areas expands on things beyond technological development issues, such as policy and managerial issues (Barletta et al., 2020; Westraadt, 2018, p. 5).

Sectoral Quality of Digitalization Management within the JSS framework

In the SG dimension, it can be traced that public service sector planning in the digitization of Yogyakarta SC has not facilitated a vital element of public policy formulation, namely the absorption of public aspirations as the substance of democracy (Gao et al., 2020, p. 4).

Although exclusively the Secretariat of the Yogyakarta Municipal Legislator has applied *e-pokkir* (representative proposal) as in some other regions, such features involving network communication between municipal legislators' members and their constituents are not yet available in the JSS application. The integration of the Municipal Legislator's secretariat service system with JSS should not be ignored. It is because the Municipal Legislator, as one of the city council strategic partners, is a political element that plays a role in the transitional vision, leadership, and organizing of SC structure (Fernandez-Anez, Fernández-Güell, & Giffinger, 2018, p. 8).

In addition, SG in SC conceptualization is known for strengthening two types of communication: asynchronous (e-mail and billboards) and synchronous (chat and debate) (Anthopoulos, 2017, p. 10). Real-time interactive chat between the community and the municipality through the JSS platform is only limited to reporting violence against women and children. The interactive feature for other types of reporting is only facilitated on different platforms such as WhatsApp, official websites (upik.jogjakota.go.id), and telephone hotlines.

While in the SE dimension, there has not been any advanced sectoral planning of overall MSME digitalized activities in JSS. One indication is the lack of optimization of marketplace transactions in the overall economic activity of MSMEs in the JSS. The maximum effort related to marketplace transactions

in Yogyakarta is limited to establishing collaboration between 23 traditional market traders and *Gojek* through the go-shop feature and providing digital voucher subsidies amounting to 10 thousand rupiah per transaction. Nevertheless, that maximum effort has not implemented an element of interconnection with the JSS platform. So far, JSS has only put forward Gandeng-Gendong and Nglarisi, which both act as a digital storefront and liaison for MSME actors and Yogyakarta Municipality procurement, with no interference of direct digital transactions for MSME products, a contradiction to their legal SE objective, which is to materialize a cashless society.

In fact, the e-commerce practice of MSME products was initiated by PT. Telkom, who is developing smart business for Yogyakarta MSMEs in 2019. Smart business by PT. Telkom has provided access to information quickly, opened market access, expanded reach, and opened business opportunities (Fauziyah, Cika; Priyambodo, Tri Kuntoro; Giyarsih, 2019). The scope of JSS against formal MSMEs in Yogyakarta is also not extensive enough. So far, only a few MSMEs in the *Beringharjo* market have official cooperation ties with the municipality. It can be understood that there is still a tiny chunk of the whole MSME actor population in Yogyakarta who already have JSS IDs. As it is known, based on the annex of Law No. 23 of 2014 on Local Government, the implementation of government affairs in the field of MSMEs mandates the collection of micro-business data as one of the important activities in the midst of MSME empowerment by the municipality. Integrating every micro-

business data into the JSS application identity collection is fundamental to achieving holistic economic digitization. In particular, data collection in the context of digital transformation to the smart economy is a fundamental element after talent management and innovation (Rodriguez, Fernandez, & Arboleya, 2018, p. 4).

Intergovernmental Sync within the SC Framework via JSS platform

Synchronization between national and municipal governments has been reflected in several features in the JSS application. Some of them include the service features in the JSS menu involving central agencies such as *PTSP* and *PPDB MAN 1* from the Ministry of Religious Affairs; Case Search, Certificate, and Case Registration from the District Court. However, other services that are essential and involve central agencies are not yet available in the JSS menu. Especially some of them related to the development of MSMEs, such as OSS for business licensing, Ministry of Cooperatives and MSMEs digital programs such as *Bela Pengadaan* from Minister of Cooperatives and MSMEs and National Public Procurement Agency, *Kakak Asuh* and *Pasar Digital (PaDi) UMKM* from Ministry of Cooperatives and MSMEs, and *Kartu Prakerja* from Ministry of Manpower, as well as digital programs from SOEs such as *Smartbusiness* from PT. Telkom.

This phenomenon causes disconnection from the central government and bears the potential to create digital service rivalry between levels of government (Asmorowati, Schubert, & Ningrum, 2021, p. 10). Links to

the central government service system need to be provided on the JSS application. As the SC dimensions demand greater efficiency in public service operationalization, greater collaboration between government and citizens, and broader general control, Interoperability of services across levels of government is something that needs to be employed in the SC platform of a municipality (Loo & Tang, 2019, p.8).

Challenges: Multisectoral integration in Yogyakarta Municipality agencies

Yogyakarta Municipality has developed JSS up to 134 services. Building service information systems is technically easy in Yogyakarta because its infrastructure and human resources tools are available. The challenge is to integrate interests between agencies into one service system objective because application development will involve many parties (Alawadhi et al., 2012, p. 43). The leadership's commitment is vital in realizing the integration between agencies in the JSS service system, starting with the involvement of agency strategic plan documents as one of the crucial fundamentals of SC design. Competence in coordinating the interests of cross-departmental regional agencies is necessary to facilitate cross-sectoral activities from the well-operated SC dimensions (Padilla et al., 2016, p. 157). The integration of business processes in JSS with regional agency performance parameters is one of the visions offered for integration efforts between agencies. The Yogyakarta Municipality has encouraged indicators of the fulfillment of community

queries as one measure of employee performance. Community reporting has been indicated in the categorization of regional agencies and has a scale of the fulfillment of reports in color indicators. For example, the red color indicates the non-fulfillment of a community report by the person in charge of the regional agency according to the category of the report. The red color itself will cause its consequences in a regional head rebuke to the relevant regional agencies.

Integration with Digital Economy Companies

Some reliable SE programs by the Yogyakarta Municipality, such as QR Code Retribution, *Dodolan*, and *Nglarisi*, have not maximized the potential of digital economy companies as strategic partners in SC development in Yogyakarta. Each of these programs seemed to step up partially because they have not integrated the features of digital economy companies such as e-commerce, delivery on-demand, and digital wallets into the entire business process (Cohen, Almirall, & Chesbrough, 2016, pp. 8–9). Nevertheless, the municipality has initiated a step in cooperation between 23 traditional markets and Go-Jek; the government's subsidy in digital vouchers on-demand platforms such as Go-Jek is an excellent effort, so it needs to be developed into a broader line of digital services. Meanwhile, the fulfillment of collaboration with other digital economies is still limited to the capacity training of SMEs supported by related digital economy companies such as *Tokopedia*. The integration of the business processes of *Dodolan* and *Nglarisi*

with the digital company cannot be done because of the digital-market-readiness of SME products and must-shared fees between the digital company and MSME actors as sellers.

In the future, the Yogyakarta Municipality needs to improve the integration of SC business processes with digital economy companies under the direction of MSME business upscaling. Several other regions, such as *Daerah Khusus Ibukota* Jakarta and the city of Surakarta, have integrated the economy of the MSME sector with collaboration with digital economy companies, such as *jakpreneur* collaboration with several marketplaces and the collaboration of Surakarta Municipality through the 'Shopee Export MSME Campus.' Similarly, the initiation of the Central Government program through the Ministry of Cooperatives and MSMEs has also led to the collaboration of business processes between MSMEs and digital economy companies to improve the economic performance of the MSME sector. The maximum utilization of e-commerce becomes an urgency, hence the pandemic (Unni, 2020, p.3).

Integration and Interoperability between levels of Government

Every agency from the central government element is a party that is vested in the implementation of the one-stop app JSS since the users of central government services are the people in the municipal territory. So far, the integration of digitalized services of central government agencies within the municipal SC has not been perfectly formed.

In terms of JSS, only the type of service from the Ministry of Religious Affairs, the Election Commission, and the District Court is available in the JSS service menu. Other types of central government digital services are not yet available in the JSS application. The integration of SC services with the Central Government needs to open JSS application access for operators of Central Government personnel. This is to facilitate the level of fulfillment of services sourced from the central government, just as the services of each regional agency are managed by the operator of each regional office.

SC development in Yogyakarta does not yet have a clear direction regarding how far the involvement of types of digital services between levels of government must be integrated into a platform. In the JSS application, the type of central government services only related to services from the Ministry of Religious Affairs, District Court, and Election Commission are displayed in the JSS menu, while in the SE category involving the Ministry of Cooperatives and MSMEs, they actually do not get a place at all, at least in the form of a description link, which also does not exist.

Integration between levels of government, including the type of services of the Provincial Government, is essential, considering that, based on the annex of Law No. 23 of 2014 on Local Government, the local government system in Indonesia still implements a concurrent governance affairs structure. The JSS application's compliance will be complicated and require complex work across sectors. Therefore, the capacity of digital infrastructure that must be prepared will

be massive. However, government interoperability needs to be simplified to obtain proportional multilevel business processes in JSS applications. Devolution schemes need to be strengthened to support the implementation of SCs because municipalities usually have the most dominant role in running SCs (Calzada, 2017, p.3).

Strategic Solution for the Development of Yogyakarta Smart City

The development planning of SC of Yogyakarta contained in the Yogyakarta Mayor's Regulation on the Yogyakarta SC Development Masterplan 2018-2022 has adopted indicators in the dimensions of SE and SG. Nevertheless, in order to strengthen participation and multilevel governance, JSS needs to increase the intensity of synchronous communication through live chat features in JSS and integrate *the e-pokkir* service into JSS. When it comes to multi-level governance, it should be built on cooperation on the principle of transition, not acquisition. It will provide adjustment, support each other, facilitate users, and avoid sectoral ego between levels of government. The urban transformation process relies heavily on the quality of the transformation of each transitional component that supports the service function (Kumar et al., 2020, p.2).

From the perspective of SE, reinforcement is still needed. Actually, JSS already has some powerful features such as *Gandeng Gendong*, *Nglarisi*, and *Dodolan*, which have fulfilled elements such as innovation, entrepreneurship, and productivity. The strengthening of local-global interconnection and workforce flexibility should involve e-commerce and on-demand delivery application-based companies that are already reputable to interconnect each MSME product with potential markets, both locally and internationally. There is no other way for the Yogyakarta Municipality but to increase cooperation with the private sector of the digital economy (Jiang, 2020, p.334). Meanwhile, to provide the element of labor flexibility, JSS needs to integrate its services with the *Prakerja* Card ecosystem so that the people of Yogyakarta can benefit more extensively. Additionally, the monumental programs of the Ministry of Cooperatives and MSMEs through the following programs: *Pasar Digital (PaDi) UMKM*, *Gerakan Nasional Bangga Buatan Indonesia*, and *Bela Pengadaan* can be integrated with Yogyakarta Municipality's JSS. Although one program is initiated by a certain level of government, in the end, the primary beneficiaries are the people in the municipal territory (Yeh, 2017, p.8).

Table 2 A Gap Analysis of Yogyakarta SC Project

| Smart Governance | | |
|--|--|---|
| Participation | | |
| Current State | Gaps | Strategy |
| Public Participation through JSS | No <i>E-Pokkir</i> , No Synchronous Chat | Integrate <i>E-Pokkir</i> to JSS; Enable real-time chat in JSS |
| Transparency | | |
| Current State | Gaps | Strategy |
| JSS and other E-Gov Initiatives | none | Maintain, Improve, and Optimize |
| Public and Social Services | | |
| Current State | Gaps | Strategy |
| 8 New Municipal Services | none | Maintain, Improve, and Optimize |
| Multi-level Governance | | |
| Current State | Gaps | Strategy |
| Acquisitional Central Govt Platforms (i.e <i>SIPD, LAPOR</i>) | Lower Yogyakarta Municipality innovation, Stagnate Local Bureaucratic Reform | Push for more transitional consent rather than acquisitional. (bottom-up approach of digital twin strategy) |
| Provide Multiple Central Govt Services within the JSS | Disorganized | Prepare for more organized central govt services to be prioritized in the JSS; Provide links in JSS for other relevant central govt services |
| Smart Economy | | |
| Innovation | | |
| Current State | Gaps | Strategy |
| 4 New Municipal Services | none | Maintain, Improve, and Optimize |
| Entrepreneurship | | |
| Current State | Gaps | Strategy |
| Home Business Camp | Not connected to Central Govt platform, i.e. <i>Prakerja</i> | Integrate to <i>Prakerja</i> System |
| JSS ID for Micro Business | Few Coverage, Only limited to sellers from Beringharjo Market. | Integrate every MSMEs business actors into JSS Digital IDs and other related digital economic platforms |
| Local & Global Interconnection | | |
| Current State | Gaps | Strategy |
| <i>Gandeng - gendong</i> | Not applying powerful features such as direct digital payment and on-demand delivery | Collaboration with digital companies that provide direct digital payment and on-demand delivery |
| <i>Nglarisi</i> | Not connected to State Owned Enterprise and Central Govt similar platform | Integrate to Smart Business by Telkom and PaDi UMKM, <i>Gerakan Nasional Bangga Belanja Buatan Indonesia</i> , and <i>Bela Pengadaan</i> by Ministry of Cooperatives and SMEs |
| Flexible Labour Markets | | |
| Current State | Gaps | Strategy |
| Online Job Exchange | Not connected to Central Govt platform, i.e. <i>Prakerja</i> | Integrate to <i>Prakerja</i> System |

Conclusion

The SC Project of Yogyakarta Municipality has reflected gaps in its conformity in adopting SE and SG dimensions, despite its reputation as one of the most well-prepared SC projects in Indonesia. This fact is unfortunate since the comprehensive version of the SC project would be a game changer for a more pandemic-resilient Yogyakarta development. In order to eclipse this SC conformity, The entirety of the SE and SG indicators of the Yogyakarta Municipality needs to be fulfilled by applying several indicators that are integral to Cohen's SC wheel. As a means of strengthening the MSME economy, the fulfillment of SE indicators needs to be fully integrated with the Ministry of Cooperatives and MSME programs through a series of monumental programs and the Ministry of Manpower programs through Prakerja cards. Business process collaboration with digital economy companies whose business cores are related to conformity so that their SE can be more adaptive to the principles of interconnectivity and flexibility of the workforce.

While the fulfillment of SG indicators needs to pay attention to the integration with the Central Government without sacrificing the functions of the Municipality application that has developed and ensures the Municipal Legislator as a manifestation of political representative institutions in the region has a room in the JSS application as well. This is necessary to increase the intensity of multilevel governance principles and participation.

In the New Normal era, indicators such as interconnectivity (through a partnership with the private sector of digital companies), labor flexibility (by integrating with the related national agenda), the synergy between levels (via the embodiment of digital twin strategy and comprehensive intergovernmental SC platform), and political involvement (that promotes the participation of municipal legislators or local politicians) are needed to restore the regional economy.

Acknowledgments

The authors are very grateful with the sponsorship contribution of The Research and Development Agency and the strong supervision of Amsal as the Senior Researchers at the National Research and Innovation Agency.

References

- Alawadhi, S., Aldama-Nalda, A., Chourabi, H., Gil-Garcia, J. R., Leung, S., Mellouli, S., ... Walker, S. (2012). Building understanding of smart city initiatives. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 7443 LNCS, 40–53. https://doi.org/10.1007/978-3-642-33489-4_4
- Albino, V., Berardi, U., & Dangelico, R. M. (2015). Smart cities: Definitions, dimensions, performance, and initiatives. *Journal of Urban Technology*, 22(1), 3–21. <https://doi.org/10.1080/10630732.2014.942092>
- Anggraini, A. T., & Iqbal, M. (2020). The Utilization of Jogja Smart Service Application: an E-Readiness

- Approach. *Journal of Governance and Public Policy*, 7(2), 150–159. <https://doi.org/10.18196/jgpp.72130>
- Anthopoulos, L. G. (2017). *The rise of the smart city. Public Administration and Information Technology* (Vol. 22). https://doi.org/10.1007/978-3-319-57015-0_2
- Asmorowati, S., Schubert, V., & Ningrum, A. P. (2021). Policy capacity, local autonomy, and human agency: tensions in the intergovernmental coordination in Indonesia's social welfare response amid the COVID-19 pandemic. *Journal of Asian Public Policy*, 00(00), 1–15. <https://doi.org/10.1080/17516234.2020.1869142>
- Astrid, R. R. K., Pribadi, U., & Iqbal, M. (2020). Factors that Influence E-Government Utilizing Towards E-Report Application (Case Study: Comparasion between Lapor Sleman and Jogja Smart Service (JSS) In 2018). *KKU International Journal of Humanities and Social Sciences*, 10(1), 1–25.
- Barletta, V. S., Caivano, D., Dimauro, G., Nannavecchia, A., & Scalera, M. (2020). Managing a smart city integrated model through smart program management. *Applied Sciences (Switzerland)*, 10(2), 1–23. <https://doi.org/10.3390/app10020714>
- Calzada, I. (2017). The techno-politics of data and smart devolution in city-regions: Comparing glasgow, bristol, barcelona, and bilbao. *Systems*, 5(1). <https://doi.org/10.3390/systems5010018>
- Cohen, B., Almirall, E., & Chesbrough, H. (2016). The city as a lab: Open innovation meets the collaborative economy. *California Management Review*, 59(1), 5–13. <https://doi.org/10.1177/0008125616683951>
- Creswell, J. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 4th Edition. The New Zealand dental journal* (Vol. 86). SAGE. <https://doi.org/10.4135/9781849208956>
- Damuri, Yose Rizal; Aswicahyono, Haryo; Hirawan, Fajar; Setiati, Ira; Simanjuntak, I. (2020). *Langkah Pemberdayaan UMKM dalam Menghadapi Covid-19*. https://doi.org/10.1007/978-1-349-67278-3_126
- Dawes, S. S. (2009). Governance in the digital age: A research and action framework for an uncertain future. *Government Information Quarterly*, 26(2), 257–264. <https://doi.org/10.1016/j.giq.2008.12.003>
- Fauzi, E. A., & Setiawan, A. (2020). Accountability Jogja Smart Service Application in Public Sector Services in Yogyakarta 2019. *SSRN Electronic Journal*, (August), 28–30. <https://doi.org/10.2139/ssrn.3528951>
- Fauziyah, Cika; Priyambodo, Tri Kuntoro; Giyarsih, S. R. (2019). Kontribusi PT. TELKOM dalam Pengembangan UMKM Perkotaan di Kota Yogyakarta. *Majalah Geografi Indonesia*, 33(2), 14–21.
- Fernandez-Anez, V., Fernández-Güell, J. M., & Giffinger, R. (2018). Smart City implementation and discourses: An integrated conceptual model. The case of Vienna. *Cities*, 78(December), 4–16. <https://doi.org/10.1016/j.cities.201>

- 7.12.004
- Gao, Z., Wang, S., & Gu, J. (2020). Public participation in smart-city governance: A qualitative content analysis of public comments in urban China. *Sustainability (Switzerland)*, 12(20), 1–20. <https://doi.org/10.3390/su12208605>
- Gumilar, M. G. (2019). Inovasi Pemerintah Daerah Jogja Smart Service Dalam Menciptakan Smart and Liveable City Di Kota Yogyakarta. *Jurnal Gama Societa*, 3(1), 19–27.
- Jiang, X. (2020). Digital economy in the post-pandemic era. *Journal of Chinese Economic and Business Studies*, 18(4), 333–339. <https://doi.org/10.1080/14765284.2020.1855066>
- Kumar, H., Singh, M. K., Gupta, M. P., & Madaan, J. (2020). Moving towards smart cities: Solutions that lead to the Smart City Transformation Framework. *Technological Forecasting and Social Change*, 153(April), 1–16. <https://doi.org/10.1016/j.techfore.2018.04.024>
- Kusnandar, V. B. (2021, October 25). Perekonomian Kulon Progo Paling Terdampak Covid-19 di DI Yogyakarta pada 2020. *Katadata.Co.Id*. Retrieved from <https://databoks.katadata.co.id/data-publish/2021/10/25/perekonomian-kulon-progo-paling-terdampak-covid-19-di-di-yogyakarta-pada-2020>
- Lombardi, P., Giordano, S., Farouh, H., & Yousef, W. (2012). Modelling the smart city performance. *Innovation: The European Journal of Social Science Research*, 25(2), 137–149. <https://doi.org/10.1080/13511610.2012.660325>
- Loo, B. P. Y., & Tang, W. S. M. (2019). “Mapping” Smart Cities. *Journal of Urban Technology*, 26(2), 129–146. <https://doi.org/10.1080/10630732.2019.1576467>
- Monzón, A., López-Lambas, M. E., Velázquez, G., & Fernández, V. (2015). ASCIMER - Assessment Methodology for Smart City Projects: Application to the Mediterranean Region. *European Investment Bank Institute*, 81.
- Novika, S. (2021). Baru 13% UMKM RI Pakai Teknologi Digital, Bagaimana Solusinya? *Detik.Com*. Retrieved from <https://finance.detik.com/berita-ekonomi-bisnis/d-5359469/baru-13-umkm-ri-pakai-teknologi-digital-bagaimana-solusinya>
- Novriando, A. (2020). Efektivitas “Jogja Smart Service” Terhadap Pelayanan Publik di Kota Yogyakarta. *Jurnal Ilmu Pemerintahan*, 13(2), 68–75.
- Padilla, M., Hawxwell, T., & Wendt, W. (2016). reviewed paper City Lab Lisbon – Development of a Smart Roadmap for the City of the Future Marielisa Padilla, Tom Hawxwell, Willi Wendt, 2(June), 151–159.
- Peek, G., & Troxler, P. (2014). City in Transition: Urban Open Innovation Environments as a Radical Innovation. *Real Corp 2014*, 8(May), 151–160.
- Petrova-Antonova, D., & Ilieva, S. (2019). Methodological framework for digital transition and performance assessment of smart cities. *2019 4th International Conference on Smart and Sustainable Technologies, SpliTech 2019*. <https://doi.org/10.23919/SpliTech.2019.8783170>

- Rodriguez, J. A., Fernandez, F. J., & Arboleya, P. (2018). Study of the Architecture of a Smart City. *Proceedings*, 2(23), 1485. <https://doi.org/10.3390/proceedings2231485>
- Rusqiyati, E. A. (2020, April 25). Dekranasda Yogyakarta perkirakan 70 persen UMKM terdampak COVID-19. *ANTARA 2020*. Retrieved from <https://www.antaranews.com/berita/1443632/dekranasda-yogyakarta-perkiraan-70-persen-umkm-terdampak-covid-19>
- Saputra, D. (2021, March 19). Survei BI : 87,5 Persen UMKM Indonesia Terdampak Pandemi Covid-19 Artikel ini telah tayang di Bisnis.com dengan judul "Survei BI : 87,5 Persen UMKM Indonesia Terdampak Pandemi Covid-19", Klik selengkapnya di sini: <https://ekonomi.bisnis.com/read/20210319/0210319/1370022/survei-bi-875-persen-umkm-indonesia-terdampak-pandemi-covid-19>
- Sharifi, A., Khavarian-Garmsir, A. R., & Kummitha, R. K. R. (2021). Contributions of smart city solutions and technologies to resilience against the covid-19 pandemic: A literature review. *Sustainability (Switzerland)*, 13(14). <https://doi.org/10.3390/su13148018>
- Unni, J. (2020). Impact of COVID-19 on Informal Economy: The Revival. *Indian Journal of Labour Economics*, (0123456789). <https://doi.org/10.1007/s41027-020-00265-y>
- Westraadt, L. (2018). A Gap Analysis of New Smart City Solutions for Integrated City Planning and Management, 145–153.
- Winata, A. I. (2016, November 30). Kota Yogyakarta Raih Penghargaan UMKM Terbaik. *Jogjadaily.Com*. Retrieved from <https://jogjadaily.com/2016/11/kota-yogyakarta-raih-penghargaan-umkm-terbaik/>
- Yeh, H. (2017). The effects of successful ICT-based smart city services: From citizens' perspectives. *Government Information Quarterly*, 34(3), 556–565. <https://doi.org/10.1016/j.giq.2017.05.001>