Smart City Development Strategy Of Wonogiri Regency

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***Abstract**.*

Technology transformation in the smart city concept begins with the implementation of policy transfer to local governments. Wonogiri Regency is one of the districts that implement smart city policy transfer from the central smart city policy. So it is necessary to analyse regional strategies in implementing smart cities. Regional smart city strategy analysis is an analysis carried out to assess the strengths weaknesses opportunities and threats in order to get a picture of the capacity and capability of the region in implementing smart city development programmes. This research aims to analyse the smart city development strategy of Wonogiri Regency. With the regional strategy analysis, Wonogiri Regency can map the right programme according to the dimensions of smart city. So that the implementation of this smart city can run smoothly in accordance with the goals of the Indonesian smart city movement. This study took a locus in Wonogiri Regency, which has a sufficient SPBE index and was chosen to be one of the implementers of the Indonesian smart city movement. Researchers used qualitative methods to analyse the strengths, weaknesses, opportunities and threats of Wonogiri Regency to develop appropriate strategies for these conditions. Researchers found that the smart city strategy is combined with other strategies to solve the problems of the Wonogiri community. The smart city action plan is formed from action plans for smart governance, smart environment, smart society; smart living; smart economy, and smart branding. The action plan must adjust to the strategy formed. The focus of the Action Plan from Wonogiri Regency is to provide integrated services ranging from data to applications.

Keywords: Strategy, Smart City, Development, and policy transfer.

I.   INTRODUCTION

Smart City" is the latest conceptualisation of how technology can improve government work [1]. Smart City has become the favourite of local governments in finding the best solution to solve problems. Although according to some studies, the term has become a brand that businesses use to sell technology (Smith & Prieto Martín, 2022). This study defines smart city as a city that "uses information and information technology to make better decisions to improve the quality of life" [2].On the other hand, the implementation of smart cities can lead to a digital divide between privileged citizens and those who are "technologically illiterate, the poor, and, in general, those marginalised from the smart city discourse" As Graham has also pointed out, there is an urban polarisation that is the technological distance between the powerful and the less powerful. Thus, the term smart city emerged, which is inclusive. This means that smart cities are for all or comprehensive. Indonesia started the inclusiveness of smart cities by transferring smart city policies through the movement towards smart cities.Wonogiri Regency is one of the regencies prepared to implement the smart city programme. Like other cities/districts, cities/districts designated towards smart cities increasingly rely on digital technology to facilitate urban life [3].The problem of realising a smart city in Wonogiri Regency has the impact that the planned program cannot be realised. The development of global technology forces regional conditions to change both social life, economy, culture, and governance. At this time the Wonogiri government is faced with the "force" of migrating all public services using technology.

Wonogiri Regency has realised the need for digital governance since 2013. Local governments are competing to create digital services for the community. Until 2017, many applications overlapped and were not interoperable with each other. There was no good cooperation, nor collaboration between services. In 2018, the initiation of one data, one door application and the like began to suppress the rate of similar applications.Every year starting in 2018, an evaluation of the Electronic-Based Government System (SPBE) is established. This evaluation is carried out to evaluate the implementation of e-government at the local government level. Of course, it also literatises local governments about specific applications for local governments. In Java Island, the average SPBE evaluation results show good results. Based on the SPBE

evaluation in 2019, Central Java Province received an SPBE index of 3.85 and was categorised as very good [4].Central Java Province is the only province that gets a very good predicate. This predicate was contributed by the SPBE index of the local government in Central Java. However, not all local governments in Central Java have a good SPBE index. One of the districts that has not good SPBE index is Wonogiri Regency [4].Wonogiri Regency in 2019 only entered the sufficient predicate with an SPBE index value of 2.51 [4]. Wonogiri's SPBE index achievement is still included in the low predicate. It is necessary to improve the implementation of SPBE at the Wonogiri Regency government level. Since the SPBE index results in 2019 came out, the Wonogiri Regency government is determined to focus on digital development. Wonogiri Regency seeks improvements in sectors that implement SPBE elements.
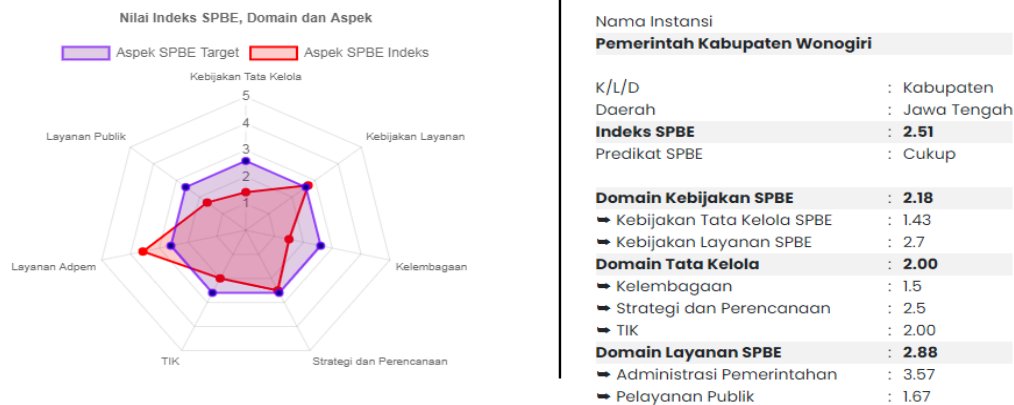
Source: [4]

Fig 1. SPBE score of Wonogiri Regency in 2019

When viewed from the 2020 regional competitiveness index, the Regency's final score is assessed covering 4 main aspects, namely the reinforcing environment, human resources, markets and innovation ecosystems, generally in the "Moderate" category. Wonogiri is quite capable of competing with other regions, in terms of technology application for the community. When viewed from references sourced from smart city topical studies, researchers have not found research results that discuss smart city implementation strategies. The research that has been done is the prerequisites of cities that will apply technology in the smart city concept [3]; compiling an overarching governance framework that expands the theoretical foundations of smart city transition from an innovation management perspective [5], the ability of leaders to drive smart city transformation [6]; smart city in relation to digital transformation [7], policy transfer in smart city development [8].Smart city initiatives have been adopted by many cities. The adoption of digital technologies has enabled cities to improve their smart city services in many areas including public administration [9], transport [10], [11], infrastructure [11], and energy [12]. There are several examples of cities in the Asia Pacific region that have successfully improved their services with smart city initiatives. For example, the Chinese city of Jinan has built a smart ecosystem to improve traffic management [13].

Another example is the Japanese city of Kakogawa that has optimised ICT platforms for their infrastructure to improve the safety and security of their citizens [14]. In terms of the energy sector, Vietnam has developed a digital smart grid system in their cities to improve energy reliability and efficiency [8]. Regarding its implementation in Indonesia, smart cities in Indonesia are developed to adopt the dynamics of formal and informal economic and social practices of its citizens [1], [15]. Most cities in Indonesia are growing rapidly along with the increasing population. City administration, economy, social practices respond to the growth of the city. Smart city initiatives follow the needs of cities and adopt local needs into their platforms. This approach enables improvements triggered by informal arrangements and improvisation by the city government and its citizens [16].The Indonesian Ministry of Communication and Information motivates smart city initiatives with a target of 100 smart cities by 2045 [17]. The ministry provides guidelines to the cities. The final design and platform will be determined by each city. Most smart cities in Indonesia have provided one or more dimensions of smart governance, smart branding, smart economy, smart living, smart society, and smart environment [15].

The operationalisation of technology in smart cities in Indonesia includes urban technologies such as transportation technology, open data portals, and participatory budgeting [14]. Almost all smart cities in Indonesia have developed smart city digital platforms, which consist of websites/web portals and mobile applications [15].This research highlights the strengths and weaknesses in current smart city transition governance approaches, leading to evidence-based strategic recommendations. The aim is to produce a strategy for smart city implementation in Wonogiri district.The urgency of this research includes the urgency of implementing a smart city development strategy. Where Wonogiri Regency has designed a smart city masterplan for the next 10 years starting from 2023-2032. This smart city development strategy is expected to be a strategic recommendation contained in a smart city masterplan that is evaluated annually. The basis for determining this smart city development strategy is the analysis of smart city implementation strategies that have been previously researched.The existence of a smart city strategy also helps the Wonogiri Regency local government in setting priority programmes based on current community problems. Each smart city dimension will be analysed using SWOT and TOWS techniques in order to consider targeted outcomes.

II.   METHODS

This research uses a qualitative approach, because this research aims to analyse the strengths, weaknesses, opportunities and threats of the smart city program in five smart city fields so that the right strategy can be known in implementing smart cities. The social problems that exist in the preparation of smart city implementation in Wonogiri Regency leave many problems. Researchers tried to map the strengths, weaknesses, opportunities and threats of smart city programmes in each smart city dimension. When mapped, the right program can solve community problems through smart city programs that are realized through each smart city dimension program (smart governance, smart living, smart social, smart economy, smart environment).The selection of research locations is adjusted to the objectives and research problems [18]. The author determines the appropriate research location, namely Wonogiri Regency. The locus of this research is the Woogiri Regency government which will implement a smart city.The technique of determining informants in this study was purposive.

This technique considers the accuracy and adequacy of information obtained from informants. The informants appointed by the researcher are considered to know and understand what is being researched. The informants in this study include informants appointed from the Communication and Information Office, Public Works Office, Environmental Agency, Transportation Agency, KKP Dispera, Trade Agency, Health Office and Education and Culture Office. So that the total number of informants in this study is 8 informants.This research uses primary and secondary data. The data collection technique in this study used in-depth interviews with relevant informants in this activity. The data obtained from the results of data collection through the interview process, observation, and documentation studies at the research location are then presented and analysed. The data was presented first in the form of words, narrative, qualitative, as well as tables and graphs. The process of presenting data is done by reading the data. The data that has been read is then analysed. The data analysis process begins with reviewing all available data from various sources. The steps of data analysis are reducing data, presenting data in qualitative form, and drawing conclusions.

III.   RESULT AND DISCUSSION

An effective smart city development strategy for Wonogiri Regency is realised from the vision, mission and goals of smart city development through the Wonogiri Regency Government. The smart city development strategy consists of 6 groups of strategies in accordance with the smart city domain. Smart city dimensions include smart governance, smart branding, smart economy, smart living, smart society and smart environment. The smart city development strategy of Wonogiri Regency based on SWOT Analysis Mapping of Smart City Elements in Wonogiri Regency

Smart Governance Strategy

Smart governance aims to realise local governance that is effective, efficient, communicative, and continues to perform bureaucratic performance through integrated innovation and technology adoption. The following is a smart city development strategy from the smart governance dimension resulting from an

analysis of the strengths, weaknesses, opportunities, and threats of the current conditions of Wonogiri Regency.

Table 1. External-Internal Analysis of Smart Governance

	strength	weakness
	Strengths and Opportunities Strategy	**Weakness and Opportunity Strategies**
opportunity	G1. Strengthening digital infrastructure in government and society. G1. Fostering and strengthening community and ICT HR volunteers in the community. Strengthening smart city institutions from G2. both the community and government sides.	G1. Simplify investment licensing services Manage CSR alternative funding optimally Create a smart city programme SOP Maximise budget absorption by optimising G3. smart city programs Increase the capacity of government human resources in the field of Information Technology G1.
	Strengths and Threats Strategy	**Weakness and Threat Strategies**
threat	G1. Improving administrative services and online-based public services G3 Strengthening policies in implementing digital transformation G2. Increase community participation in realising smart cities G1. Improve digital literacy of the community, especially literacy about G1. public services Increase internet access to broadband with adequate speed	G1. Integrating administrative application services and public services. G2. Increase the capacity and competence of innovative and collaborative ASN human resources utilising local communities. G1. Improve digital infrastructure for adequate internet access G3. Develop a sustainable community e-hearing mechanism in policy making

Specifically, the smart city strategy is reinforced into strategies per subdimension of the smart governance pillars to be more focused and precise in determining the action plan and roadmap for smart city development in Wonogiri Regency. The Specific Strategy per Subdimension is as follows.

Table 2. External to Internal Strategy of Smart Governance Dimension

Subdimensions	Strategy Subdimension	OPD
G1 – Administrative Services and Public Services	1. Improve online and integrated administrative services and public services. 2. Strengthen digital infrastructure within the government and community	Dispendukcapil, BKD, Diskominfo, BPKD, PMD
G2 – Bureaucracy Management	1. Improving synergy and collaboration between OPDs in implementing cross-OPD programmes 2. Increase community capacity and participation in development through the utilisation of digital literacy	Semua OPD
G3 – Public Policy Efficiency	3. Continuously develop community e-hearing mechanisms in policy making	Bappeda, Bagian Hukum

Smart Branding Strategy

Smart branding aims to market the region so as to increase regional competitiveness by developing three elements, namely tourism, investment, trade and city image. Increased regional brand value will encourage economic activity and the development of local social and cultural life, which will lead to improved community welfare. The development of smart branding in Wonogiri Regency can be achieved with supporting strategies. The following is a general smart city development strategy from the smart branding dimension resulting from an analysis of the strengths, weaknesses, opportunities, and threats of the current condition of Wonogiri Regency.

Table 3. External-Internal Analysis of Smart Branding

	strength	weakness
	Strengths and Opportunities Strategy	**Weakness and Opportunity Strategies**
opportunity	B1. Increasing the participation of self-help forums in smart city development B2. Realising licensing services through integrated and interoperable MPP Online	B3 Building boundaries and city faces that are distinctive to Wonogiri Regency
	Strengths and Threats Strategy	**Weakness and Threat Strategies**
threat	B1. Provide public recreation services that can be B1. booked/registered online B1. Utilising digital in packaging Wonogiri Regency culture Digitising Wonogiri Regency's cultural records	B2 Optimising digital marketing in marketing recreational areas in Wonogiri Regency

Specifically, the smart city strategy is reinforced into a strategy per subdimension of the smart branding pillar to be more focused and precise in determining the action plan and road map for smart city development in Wonogiri Regency. The Specific Strategy per Subdimension is as follows

Subdimensions	Strategy Subdimension	OPD
B1 - Tourism	1. Provide public recreation services that can be booked/registered online 2. Increase the participation of self-help forums in tourism and smart city development 3. Digitising the cultural footprint of Wonogiri Regency 4. Organising virtual cultural performances of Wonogiri Regency	Dispora, Dinas Pendidikan & Kebudayaan
B2 - Business Branding	5. Realising licensing services through an integrated and interoperable MPP Online 6. Optimising the marketing of Wonogiri Regency's creative industry products and services via online	Disporapar, Disperindag KUKM, DPMPTSP
B3 - City Interface	7. Building regional boundaries and city faces that are typical of Wonogiri Regency	Dinas PU

Smart Economy Strategy

Smart economy is a smart economic governance with the aim of realising an economic ecosystem in the region that is able to meet the challenges of the disruptive information age and demands a fast adaptation rate like today. Changes that occur in the current information era, increasing people's financial literacy by realising a financial transaction ecosystem (less-cash society). The market has not gone unnoticed. All stakeholders must sit together to formulate growth strategies on thematic market development and markets with new approaches, developing new geographic markets, demographic segments, or truly new users. The following is a general smart city development strategy from the smart economy dimension resulting from an analysis of the strengths, weaknesses, opportunities, and threats of the current condition of Wonogiri Regency.

Table 5. Smart Economy External-Internal Analysis

	strength	weakness
	Strengths and Opportunities Strategy	**Weakness and Opportunity Strategies**
opportunity	Ec1. Optimising digital-based market, digital delivery service available Ec2. Optimising online-based retribution services	Ec1. Opening a digital market for local Ec2. products Ec3. Optimising one data on the welfare of Wonogiri Regency Encouraging the use of cash less money in public service transactions with a collaboration system with cash less service providers
	Strengths and Threats Strategy	**Weakness and Threat Strategies**

	strength	weakness
threat	Ec1. Optimising MSMEs to utilise Ec1. online product delivery Ec.2 Creating new businesses that utilise the potential of the Wonogiri environment Provide labour skills training in ICT	Ec2. Scaling up urban agriculture innovation Ec2. Optimising merchants using an online Ec2. food supplier mapping system Optimising online-based employment services

Specifically, the smart city strategy is reinforced into strategies per subdimension of the Smart Economy pillar in order to be more focused and precise in determining the action plan and roadmap for smart city development in Wonogiri Regency. The Specific Strategy per Subdimension is as follows.

Table 6. External to Internal Strategies of the Smart Economy Dimension

Subdimensions	Strategy Subdimension	OPD
Ec 1 - Competitive Industry	1. Develop a farmer mobile application 2. Develop urban agriculture and realise online-based agricultural carrying capacity	Dinas Kelautan, Perikanan, Peternakan; Dinas Pertanian & pangan
Ec 2 - Community Welfare	Optimise online-based retribution services 4. Optimising online-based employment services 5. Creating new businesses that utilise the potential of Wonogiri's environment	Disperindag & KUKM; Dinas perumahan rakyat KPP; Disnaker
Ec 3 - Financial Transactions	6. Encouraging the use of cash less money in public service transactions with a collaboration system with cash less service providers	Dinas perindag & KUKM

Smart Living Strategy

Smart living is an indicator to ensure the viability of the living standards of the people in the neighbourhood. The main goal of the smart living dimension is to create a decent, comfortable, and efficient living environment. The following is a general smart city development strategy from the smart living dimension resulting from an analysis of the strengths, weaknesses, opportunities, and threats of the current conditions of Wonogiri Regency.

Table 7. Smart Living External-Internal Analysis

	strength	weakness
	Strengths and Opportunities Strategy	**Weakness and Opportunity Strategies**
opportunity	Lv2. Improve sports facilities in each village Lv1. Build pedestrianised roads	Lv1. Provide modern medical devices integrated in the medical data centre Lv1. Establish an interoperable medical data centre Lv1. Developing information system applications on road, bridge, irrigation and clean water management Realising a livable, comfortable, and efficient residential environment
	Strengths and Threats Strategy	**Weakness and Threat Strategies**
threat	Lv2. Build an interoperable medical data centre	Lv1. Provide an online unified health file accessible to healthcare providers Lv1. Provide access to real-time public warning systems for air and water quality advisories Lv1. Provide public roads and paid roads covered by real-time online traffic alerts and information Lv3. Optimising the use of public transport for economic activities that can be accessed online. Providing smart traffic Provide a fleet of motorised city buses Lv3. Build roads according to their designation/roads that are compatible with driving systems

Specifically, the smart city strategy is reinforced into strategies per subdimension of the Smart Living pillar in order to be more focused and precise in determining the action plan and roadmap for smart city development in Wonogiri Regency. The Specific Strategy per Subdimension is as follows.

Table 8. External to Internal Strategies of the Smart Living Dimension

Subdimensions	Strategy Subdimension	OPD
Lv 1 - Spatial Harmonisation	1. Develop information system applications on road, bridge, irrigation and clean water management 2. Realising a livable, comfortable and efficient residential environment.	Dinas PU
Lv 2 - Health and Sport Infrastructure/Supplies	3. Provide fast and online-based health services 4. Improving online and accessible women's and children's protection services 5. Provide modern medical equipment integrated into the health data centre 5.	Dinas Kesehatan dan RSUD, Dinas PPKB & P3A
Lv 3 - Transport Infrastructure/Supplies	6. Building smart traffic	Dinas Perhubungan

Smart Society Strategy

Smart society is a dimension that discusses a lot about humans as the main element of a region's development. Human interaction has moved towards a digital ecosystem. Where virtual conditions in the daily lives of citizens are increasingly intertwined intensively. Interactions between citizens are increasingly strong and without barriers either directly or with technological mediation. This is in line with the goal of smart society to realise a humanist and dynamic society, with the development of three elements in smart society, namely citizen communities (community), learning ecosystems (learning) and security systems (security). The following is a general smart city development strategy from the smart society dimension resulting from an analysis of the strengths, weaknesses, opportunities, and threats of the current conditions of Wonogiri Regency.

Table 9. Smart Society External-Internal Analysis

		strength	weakness
		Strengths and Opportunities Strategy	**Weakness and Opportunity Strategies**
opportunity		S2. Improve the existing library and make it a community learning centre facility.	S2. Establish a public library data centre and publicly accessible e-book titles S2. Increase public interest in accessing public libraries S3. Create a disaster information system in Wonogiri Regency S3. Optimising interoperable CCTV
		Strengths and Threats Strategy	**Weakness and Threat Strategies**
threat		S1. Integrate interoperable social data Train the workforce with language skills S2. Making computers, laptops, tablets or other digital learning devices available per 1,000 students S2. Provide specialised science, technology, engineering and maths courses at local universities	S2. Provide public buildings that are accessible to people with special needs S2 Allocate budgets for the provision of mobility aids, devices, and assistive technologies for citizens with special S2. needs Build marked pedestrian crossings equipped with accessible pedestrian signals

Specifically, the smart city strategy is reinforced into strategies per subdimension of the Smart Society pillar to be more focused and precise in determining the action plan and roadmap for smart city development in Wonogiri Regency. The Specific Strategy per Subdimension is as follows.

Table 10. External to Internal Strategies of Smart Society Dimension

Subdimensions	Strategy Subdimension	OPD
S1 - Efficient Community Interaction	1.Integrating interoperable social data to support social protection	Dinas Sosial, Disnaker
S2 - Efficient Learning Ecosystem	2. Improve education services based on information technology 3. Establish a public library data centre and publicly accessible e-book titles 4. Increase certified professional cyclists	Dinas Kearsipan
S3 - Community Safety and Security System	5. Creating a disaster information system in Wonogiri Regency 6. Increase the number of interoperable CCTVs 7. Improve security and safety using the Internet of Things	BPBD; Dinas Perhubungan, Bakesbangpol, Diskominfo, Satpol PP, nagian hukum (JDIH)

Smart Environment Strategy

The final dimension of a Smart city is smart environment management. A smart environment is a condition where there is as much attention given to the environment in the development of the city as there is to the development of physical infrastructure and the development of facilities and infrastructure for citizens. The basic idea of smart environment in a Smart city is the direction to realise the vision of sustainable development of the vision of a smart city, which should not be lost with the birth of the idea of Smart city that makes technology as a supporting element. The following is a general smart city development strategy from the Smart Environment dimension resulting from an analysis of the strengths, weaknesses, opportunities, and threats of the current conditions of Wonogiri Regency.

Table 11. Smart Environment External-Internal Analysis

		strength	weakness
		Strengths and Opportunities Strategy	**Weakness and Opportunity Strategies**
opportunity		Ev1. Building a water system using smart technology	
		Strengths and Threats Strategy	**Weakness and Threat Strategies**
threat		Ev2. Provide public waste bins that are sensor-enabled public waste bins Ev2. Build an integrated waste management system Ev1. Apply green building principles to buildings constructed or refurbished in the last 5 years	Ev2. Establishing technology for wastewater treatment in which the processed wastewater can be reused Ev2. Build a network of wastewater pipelines that are monitored by a real-time sensor data tracking system Ev1. Provide drinking water tracked by real-time water quality monitoring stations Ev1. Conduct real-time environmental water quality monitoring per 100,000 population Ev1. Provide a municipal water distribution network monitored by an intelligent water system

Specifically, the smart city strategy is reinforced into strategies per subdimension of the Smart Environment pillar so that it is more focused and precise in determining the action plan and road map for smart city development in Wonogiri Regency. The Specific Strategy per Subdimension is as follows.

Table 12. External to Internal Strategies of the Smart Environment Dimension

Subdimensions	Strategy Subdimension	OPD
Ev 1 - Environmental Protection	1. Provide sustainable access to clean water and irrigation water 2. Improve sustainable environmental governance	Dinas LH
Ev 2 - Waste and Waste Management	3. Realising environmental balance	Dinas LH
Ev 3 - Energy Management	4. Develop sustainable environmentally friendly alternative energy	Dinas LH

IV.   CONCLUSION

The smart city strategy is combined with other strategies to solve Wonogiri community problems. The smart city action plan is formed from action plans for smart governance, smart environment, smart society; smart living; smart economy, and smart branding. The action plan must adjust to the strategy formed. Currently Wonogiri Regency is in the smart city development stage, so the right strategy in smart city development is to intensify all strengths and pay attention to existing opportunities.

V.   ACKNOWLEDGMENTS

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