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Smart City Development Models: A Cross-Cultural Regional Analysis

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ABSTRACT

This study aims to prove that the Smart City development model using a regional cross-cultural approach can develop a city into a smart city in accordance with the regional development program that has been determined.This study uses a qualitative approach. 3 (three) agencies implementing the smart city program are random sampling in this study And the research results will show the effectiveness of the smart city development model.

Keywords : Smart city, Cultural regional,

INTRODUCTION

Smart city development has become a crucial topic as cities face transformation and increased needs for higher-quality planning needs for higher quality decisions. With the pressure of growing urban populations and accelerating urbanization (Frey & Zimmer, 2001), governments and city administrators urgently need to find innovative ways to improve the sustainability of their cities, provide higher quality public services, and meet the growing needs of their residents, as existing urban resources and potentials have been fully exploited. To help cities transcend the limits of development under existing techno- logical conditions (Einstein & Kogan, 2016) and eliminate the negative impacts of economic development such as environmental pollution, unequal distribution of resources, and rising crime rates, the concept of smart cities has been introduced into the field of planning and has begun to be practiced under the impetus of technological development in tandem with the wave of modernist ideas (Batty, 2017). The reason why academics seldom explicitly mention the origin of the concept of smart city and the process of construction and development is that many countries intervene in the goals and standards of smart city construction based on their regional cultures and practical needs (Yang, 2020), so there is an urgent need to systematically explore various types of smart cities from a cross-cultural and geographical perspective. Some scholars espouse the conception of the smart city, first originating from the concept of digital city

The existence of cities continues to change and experience very significant developments and has a big influence on human life patterns and civilization. However, the faster and bigger a city grows, the bigger the problems that arise in that city tend to be. Various Urban Development Issues and Problems

1. Urbanization and significant increase in urban population
2. The quality of the urban living environment is increasingly decreasing
3. Poverty in urban areas
4. Regional capacity in urban development and management in the decentralized era
5. The growth rate between cities is not yet developed

Regarding these various urban problems, this gives rise to an urgent need and at the same time a challenge to find "smart" ways and appropriate strategies to solve the problems that occur and improve the welfare of urban residents. The smart city concept emerged as an innovative alternative instrument and began to be applied in large cities throughout the world.

A. Measurement of Smart City Maturity Levels for 3 (three) The cities are Bandung, Bogor and Makassar based Ganesha Smart City Maturity Model (GSCMM)

The components of smart city maturity that will be measured based on GSCMM consist of: from the 3 main clusters, namely smart economy, smart society and smart environment, where these 3 (three) clusters will be driven via ICT/TIK (Information Technology and Communication) as enablers. Results of measuring Smart City maturity levels for the cities of Bandung, Bogar and Makassar are as follows.

1. Bandung City Smart Economy

Based on the Smart Economy Conditions in Bandung City Figure 1 , the following data is obtained

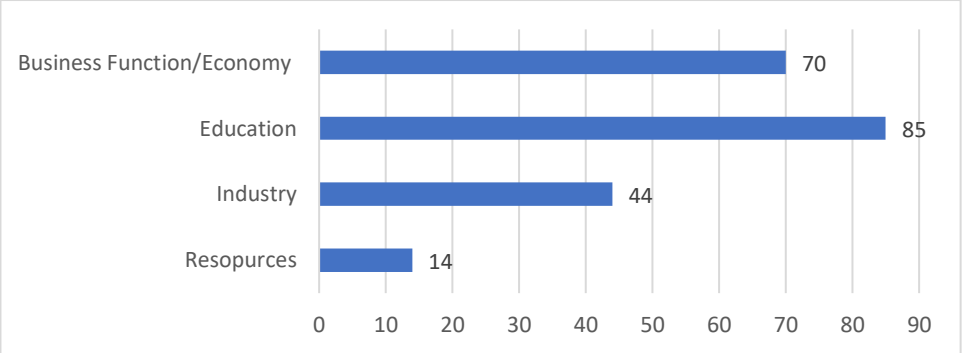

Figure 1. Smart Economy Conditions in Bandung City

From an economic point of view, in general the city of Bandung has very good economic growth with the support of a very adequate business center. People have the convenience of making transactions in business centers. The score for the business center aspect of Bandung City is 70.

From an economic point of view, in general the city of Bandung has growth Very good economy with very adequate business center support. People have the convenience of making transactions in business centers.

2. Bandung City Smart Society

Based on Figure 2 , the digital social aspect is the most satisfying aspect of the City Bandung. This is characterized by the emergence of so many social communities and digital. The score for digital social is 90

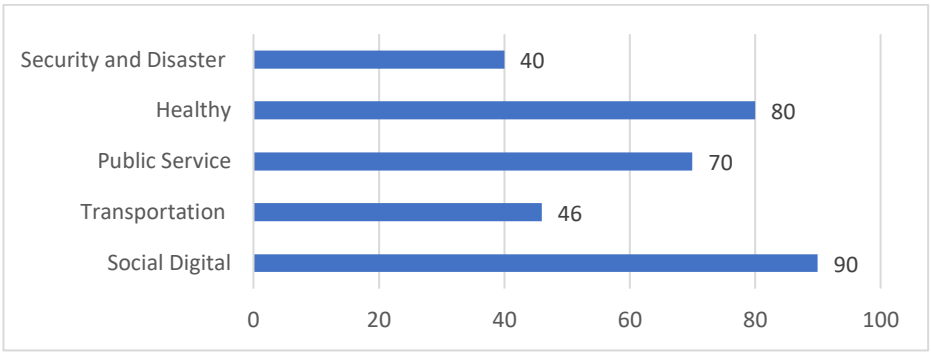

Figure 2. Smart Society Conditions in Bandung City

3. Bandung City Smart Environment

Based on Figure 3 , for spatial management, the City of Bandung pays close attention to creating good spatial planning in accordance with RTRW, city image and green open space planning. The score for the spatial aspect of Bandung City is 60.

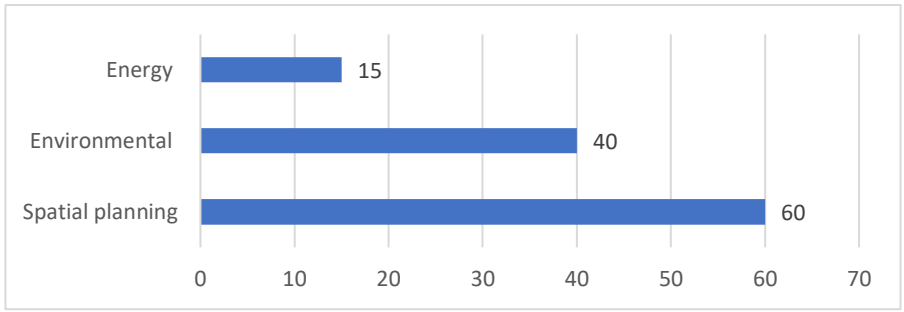

Figure 3. Conditions of the Smart Environment in Bandung City

4. Bandung City Smart ICT Infra Structure

Bandung City's ICT-based smart city services are generally quite good, starting with many services that can be accessed by the public, especially in social areas and several public services. Economic services have begun to be provided using various applications, although some are still being provided partially. The score for the IT service aspect in Bandung City is 68.

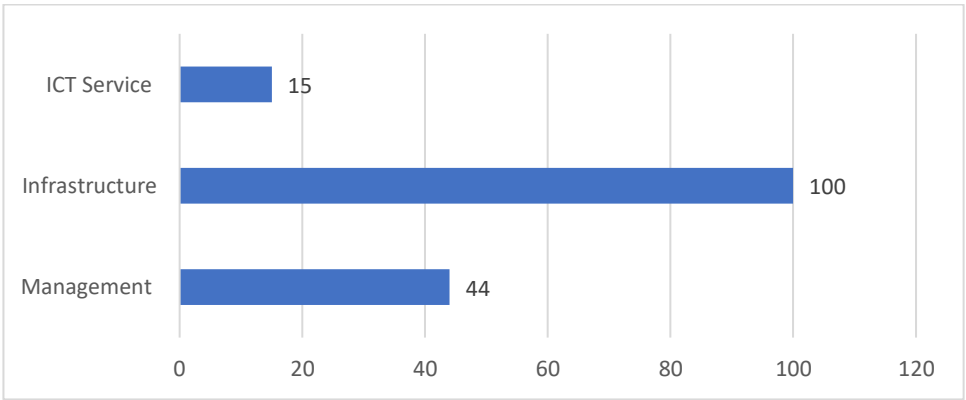

Figure 4. The condition of ICT as an enabler for the City of Bandung

Smart City Implementation Maturity Level in Bandung CityBased on the results of the calculations above, the level of implementation maturity is determined Smart City in Bandung City is at the Scattered level with a value of 55.17

Table 1. Calculation of Smart City maturity level for Ban Dung City

ECONOMY	SOCIETY	ENVIRONMENT	ICT	AVERAGE
66,37	65,2	36	53,12	55,17

2. Bogor City Smart Economy

Based on Figure 5. In general, the economic level in Bogor City is growing quite well tends to be high with GRDP growth potential above 75 and level low unemployment. Score for the business/economic center aspect of Bogor City is 75.

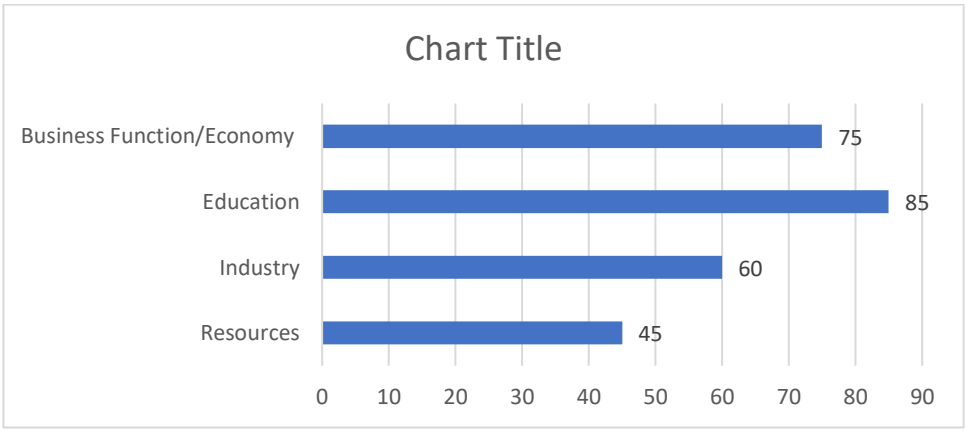

Figure 5 Economc Conditions of Bogor City

Smart Society

Based on Figure 6 The public service aspect can be said to be the mainstay of Bogor City. Service provided is very transparent, and the infrastructure is also very supportive. But unfortunately it is not well socialized. Scores for aspects of City public services Bogor is 75.

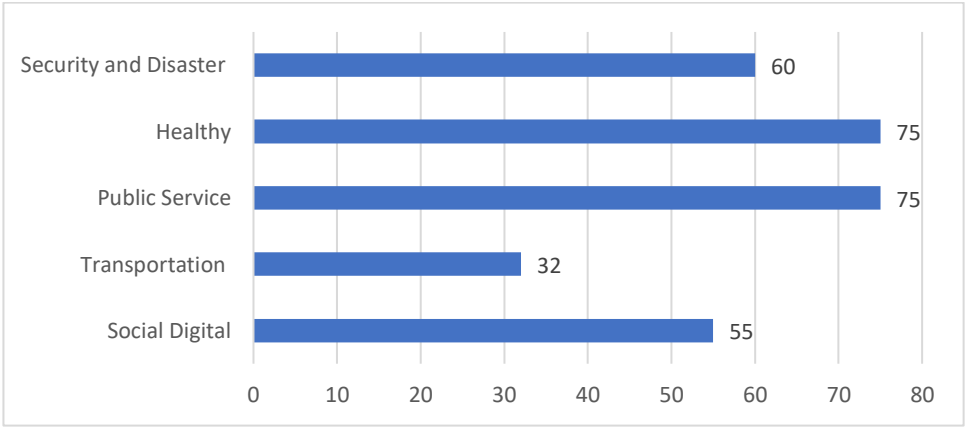

Figure 6. Condition of Smart Society Bogor City

Smart Environment

Based on Figure 7 From an environmental point of view, the level of environmental pollution in Bogor City is not too big, both air and water. The countermeasure concept is still being implemented manually. The score for the environmental aspect of Bogor City is 65.

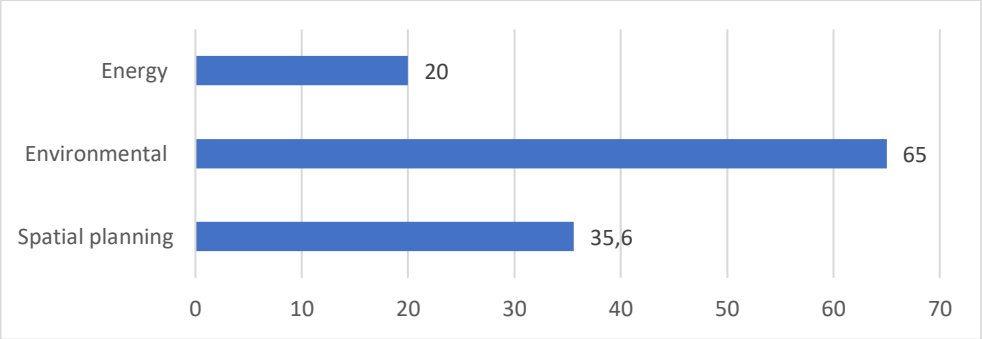

Figure 7. Conditions of the Smart Environment in Bogor City

ICT as an Enabler

However, ICT-based services are felt to be less widespread evenly across all work units/SPKD. Some work units have applications separately, such as in the Department of Education and DLLAJR. Meanwhile at the health department almost no ICT-based services. ICT service maturity score as enablers in Bogor City are 59.

Meanwhile, from an ICT infrastructure perspective, the City of Bogor continues to develop several supporting infrastructure for improving ICT services. However development is still not optimal. Maturity score for the aspect Bogor City's ICT infrastructure is 47.

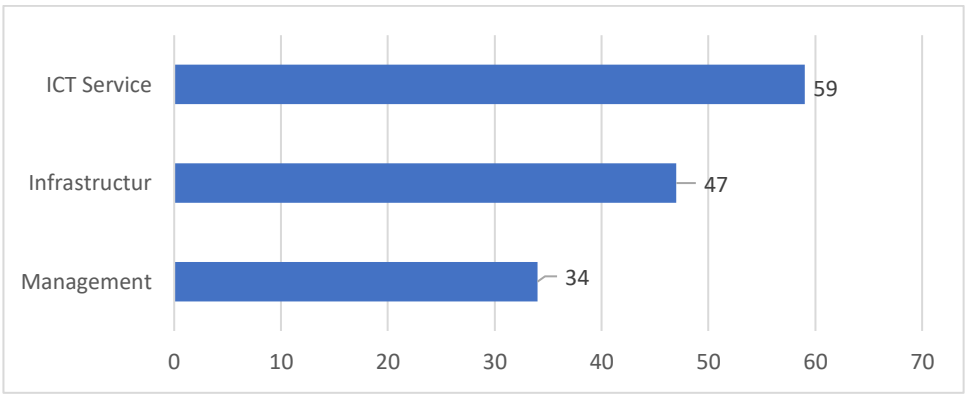

Figure 8. The condition of ICT as an enabler for the City of Bogor

Smart City Implementation Maturity Level in Bogor City

Based on the results of the calculations above, the level of implementation maturity is determined Smart City in Bogor City is at the Scattered level with a value of 53.31.

Table 2. Calculation of Smart City maturity level for Bogor City

ECONOMY	SOCIETY	ENVIRONMENT	ICT	AVERAGE
66,25	59,4	40,2	46,67	53,13

3. Makassar City Smart Economy

Makassar City's economic growth is generally very good with support very adequate business center. The community has the convenience to transact in business centers. Scores for the maturity of business center aspects and Makassar City's economy is 75.

The educational environment is also growing well with the number of students and AKP Higher education is very high with a very large number of schools and campuses adequate and small illiteracy rate. City education aspect maturity score Makassar is 95

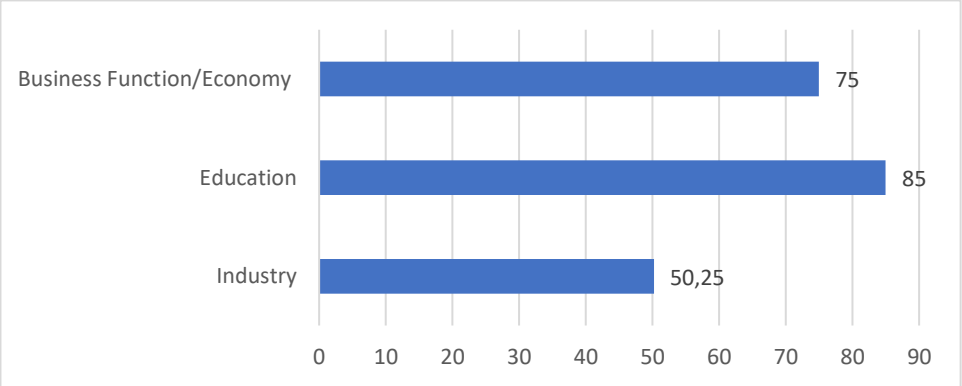

Figure 9. Economic Conditions of Makassar City

Smart Society

For the health aspect, Makasar City is at a good level, namely integrative with a score of 75, where access to hospitals is very easy.

Apart from that, the number of doctors is felt to be adequate, although not yet complete ideal. One of the problems related to this aspect is the number of treatment rooms and the facilities are still not good.

Furthermore, in terms of public services in Makassar City, procedures and services is good enough, although not completely ideal. HR capabilities managing is also quite supportive. Level of public services in Makassar City is in the initiative position with a score of 75.

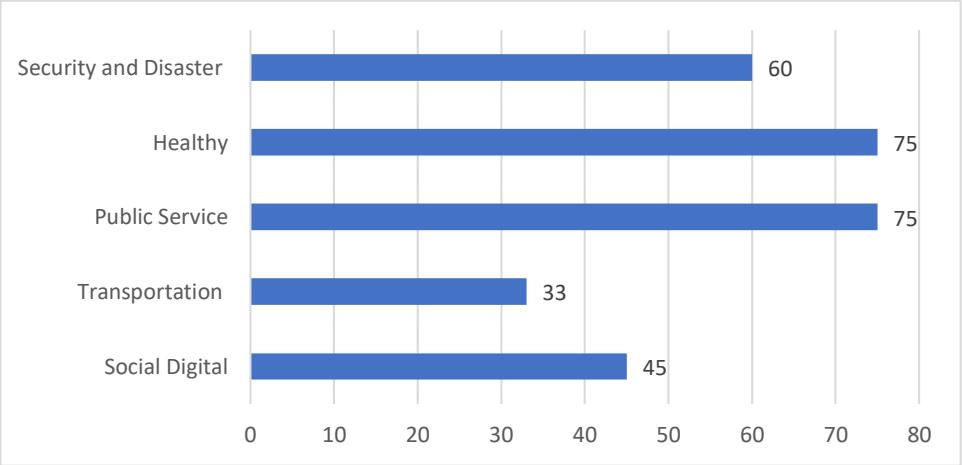

Figure 10. Condition of Smart Society Makassar City

Smart Environment

Environmental management in Makassar City is felt to be quite good at the level water and air pollution below 20c. Especially for waste management in the City Makassar is quite good with management up to 80%. Score for aspect Makassar City's environmental maturity is 75.

Furthermore, in terms of spatial aspects of Makasar City, the maturity score reached 80. Almost all development and space management achieves compliance withSpatial , land use plan (Laban use plan) and city image.

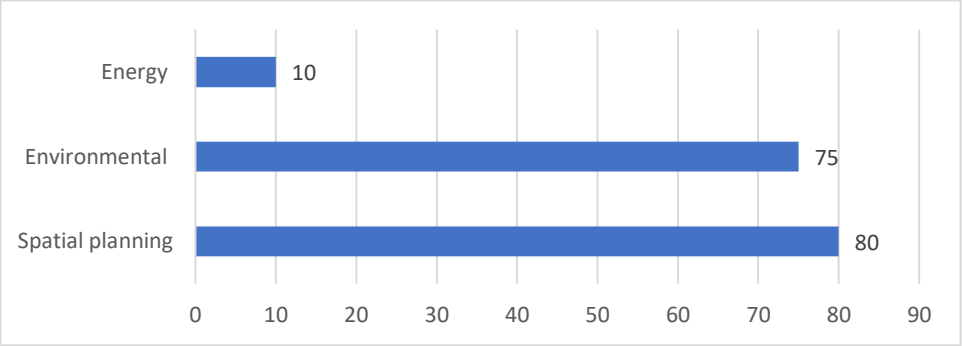

Figure 11. Conditions of the Smart Environment in Makassar City

ICT as an Enabler

As an enabler, ICT has a very important role in making this happen smart city concept. In Makasar City, in general it is still in the same position initiate with a score of 40.67, where support from ICT is felt to be quite large but still partially, namely in several SKPDs only.

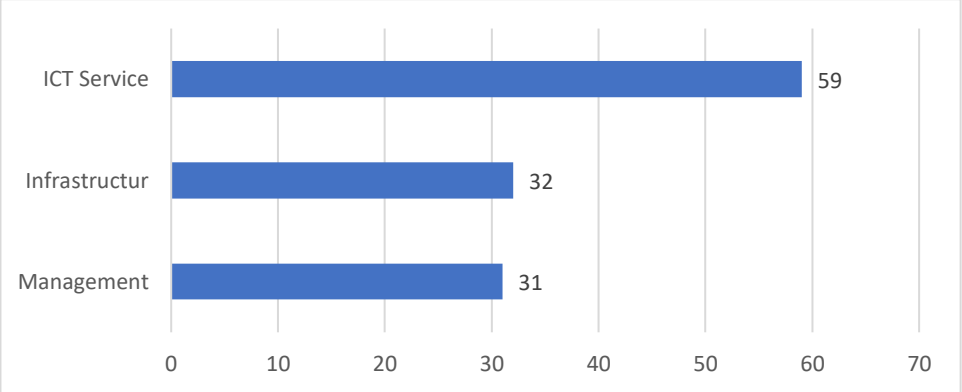

Figure 12. The condition of ICT as an enabler for Makassar City

Smart City Implementation Maturity Level in Makassar City Based on the results of the calculations above, the level of implementation maturity is determined Smart City in Makassar City is at the Scattered level with a total score of 55.31.

Table 3 Calculation of Smart City maturity level for Makassar City

ECONOMY	SOCIETY	ENVIRONMENT	ICT	AVERAGE
68,7	57,4	54,45	40,67	53,31

B. Analysis of the potential and problems of Smart City development in Three Cities in Indonesia

POTENTIAL	PROBLEMS
There is support from the central government and the Smart City Development Plan has been included in the Urban Development Plan development road map	There is no clear Road Map from each regional government to develop the Smart City concept
The regional government's desire to develop the Smart City concept	The level of Smart City implementation is not yet at a satisfactory level. The results of the study based on GSCMM also show that Smart City implementation for all cities is generally still at a scattered level
Several Smart City components have begun to be implemented quite well, such as smart government and smart ICT infrastructure	There are still many aspects of city management that do not yet apply smart principles with ICT support, such as spatial planning (Smart Environment) and smart mobility.

C. Recommendations for Smart City Models in Indonesia

Based on the results of studies that have been carried out on development models smart city and also considering the potential and problems found in 3 prototype city, then recommendations for the smart city model to be developed are obtained. The indicators for each component in this model will be specific to aspects]spatial planning. The smart city model developed consists of 5 (five) main components, namely:Smart people (intelligent society), Smart Government (government that smart), Smart Infrastructure, (Smart ICT Infrastructure), Smart Environment (smart environment), and Smart Mobility (smart movement).

1. Smart People

Smart people can be said to be the main goal that must be fulfilled in realizing the Smart City concept. Smart people have a target for society have the ability to access technology and have access easy on technology. Specifically related to aspects of spatial planning, Smart People aims to make it easier for people to obtain things access information related to spatial planning activities, and therefore at the same time to increase community participation in spatial planning activities.

2. Smart Infrastructure

Smart infrastructure is a city that has good ICT infrastructure (ICT infrastructure) in maximizing the city's potential and providing services, computerized data or information about society and information technology. Smart infrastructure in relation to arrangement space is a form of ICT infrastructure support in making it a success spatial planning activities.

3. Smart Government

Smart government can be interpreted as an intelligent government that provide services to the community quickly, easily and transparently through the use of good technology

4. Smart environment

Smart environment is the creation of cities and environments that are livable through various facilities that can provide comfort and convenience to society in living their lives. In the aspect of spatial planning we will look specifically at smart green waste, smart green water, smart green

energy. Apart from that, we will also see how spatial planning activities are based ICT.

5. Smart mobility

Smart mobility is a part or dimension of a specialized smart city on transportation and mobility or community movement. In this smart mobility there is a smart transportation and mobility process, so it is hoped that this will be created public services for better transportation and mobility as well as removing general problems in transportation, for example traffic jams, traffic violations traffic, pollution and others

C. Proposed Smart City Development Roadmap

Based on the recommendations for the smart city model, a roadmap or action plan in achieving the realization of a Smart City which is detailed based on each the components are as follows:

Smart People

Table 3. Roadmap or Action Plan for Smart People indicator

INDICATOR	PROGRAMS	YEAR
Strengthening human resources IT infrastructure in the field Spatial planning	HR training managing IT infrastructure in field of spatial planning	**2015 - 2018**
Increasing community participation in spatial planning	1. Increased collaboration with universities and colleges in developing smart cities based on spatial planning	**2015-2018**
	2. Increased cooperation and partnerships with companies private service providers ICT	**2015-2018**
	3. Organizing musrenbang in line	**2015 - 2018**

Smart Infrastructure

Tabel 4. Roadmap or Action Plan for Smart ICT Infrastructure Indicators

INDICATOR	PROGRAMS	YEAR
Strengthening ICT infrastructure adequate for society	**1.**Provision of public computers in place at- public place	**2015 - 2018**
	2.Providing network infrastructure adequate computer in wireless form for LAN, WAN, and the internet in public spaces such as in city parks, stations.	**2015-2018**
	3. HR training to fulfill need for IT/HR personnel competent to manage, maintain, and develop existing infrastructure	**2015-2018**
Develop ICT infrastructure integrated for increase government performance and service public	1. Data center development	**2015 - 2018**
	2. Development of fiber optic networks government agencies	**2015-2018**
	3.Security system development information	**2015-2018**

Smart Government

Table 5. Roadmap or Action Plan for Smart Government Indicators

INDICATOR	PROGRAMS	YEAR
Governance e-government	ICTInstitutional Development, through activities:	**2015 - 2018**
	1. Preparation of regulations and SOPs	**2015-2018**
	2.Increased quality and quantity ICT human resources	**2015-2018**
Development nformation Systems integrated ones in line with the vision city development (e-government)	Information system development community service management	**2015 - 2018**
	Development of executive information systems	**2015-2018**
	Development of city government websites	**2015-2018**
	Development of integration of related data spatial planning	**2015-2018**

Smart Environment

Tabel 6. Roadmap or Action Plan for Smart Environment Indicator

INDICATOR	PROGRAMS	YEAR
Management environment	Environmental data integration	**2015 - 2016**
Smart Green Waste	Based waste management ICT	**2015-2020**
	Garbage sensor	**2017-2018**
Smart Green Water	ICT-based water management	**2015 - 2020**
Smart Green Water	Development of an energy monitoring system	**2016-2017**
	Smart metering development	**2017-2018**
	Development of smart green buildings	**2017-2018**
Maintenance arrangement activities space based ICT	Online licensing	**2015 - 2020**
	Development of information systems and spatial planning communication	**2015 - 2020**
	Data collection, data processing, and data analysis for planning ICT-based spatial planning	**2015 - 2020**

Smart Mobility

Table 7 Roadmap Atau Rencana Aksi Untuk Indikator *Smart Mobility*

INDICATOR	PROGRAMS	YEAR
Management transportation	Strengthening the transportation database	**2018 - 2020**
	Transportation system audit	**2018-2020**
Intellegence Transport System (ITS).	Traffic management on highways it's better to make use of it computers and information technology (traffic nformation system)	**2020-2035**
	Management of travel! package information computer-based travel and information Technology	**2020-2035**
	Procurement of intelligent control equipment embedded in means of transportation based on information technology and computer	**2020-2035**

CONCLUSION

This study shows that cross-cultural and regional approaches in the development of *smart city*It is very important to ensure compliance with local needs and regional potential. Case studies in three cities in Indonesia, Bandung, Bogor, and Makassar show that although there has been an initial implementation of smart cities, the maturity level is generally still at the "scattered" stage. This indicates that the implementation of smart cities has not been carried out in an integrated and systematic manner.

Some aspects such as *smart economy* And *smart society* has developed well in these cities, but there are still significant weaknesses in the aspects *smart environment* And *ICT as an enabler*, especially in spatial planning and integration of information technology in public services. This study also highlights that the absence of a clear roadmap from the local government is a major obstacle in the development of an effective and sustainable smart city.

Suggestion

1. Regional governments need to prepare a development roadmap *smart city* which is structured and specific, adapted to local potential and challenges, emphasizing a culture-based approach and regional needs.
2. Increasing human resource capacity and community participation is very important, especially in terms of digital literacy, understanding of urban spatial planning, and the ability to access technology-based public services.
3. Strengthening ICT infrastructure evenly and integrated across all regional apparatuses (SKPD) needs to be a priority, so that digital public services can run optimally and inclusively.
4. Coordination between the central and regional governments must be strengthened in terms of preparing regulations, funding, and evaluating the implementation of smart cities, in order to create synergy in achieving key indicators such as smart mobility, smart governance, and smart environment.
5. Periodic evaluation of the smart city maturity index based on models such as GSCMM should be conducted to monitor progress and adjust strategies dynamically.

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