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Digital Readiness Analysis in Bandung Government for Smart City Implementation

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Abstract

Digital readiness is the willing to switch to digital process workflows supported by technological innovation. It is changing the way business is conducted, creating unprecedented opportunities. Digital readiness is known as the pre-requisite for digital transformation in implementing smart governance to build a smart city. The purpose of this study is to explore the effect employing smart strategies and digital readiness of smart innovation initiatives on the governance of Bandung city government. A total of 400 questionnaires were collected from 27 offices of the Bandung city government using online questionnaire, website link and face to face collection from the respective offices. Data collected were examined using multiple regression analysis. This research found that employing smart strategies and digital readiness are positively and significantly affecting the outcome of smart governance of Bandung city government.

Keywords: Digital Readiness, Smart City, Smart Governance, Information Communication Technology, Digital transformation

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1. Introduction

Digital readiness is the process by which the organization is willing to switch to digital workflows supported by software and technological innovation. It is the process and desires to change and adopt digital technologies to transform organizations in all the economic sectors of a country to achieve organizational aspirations and create growth opportunities efficiently (Nasution et al., 2018). The concept of Smart City has been considered a new direction to transform a region and strengthen a city's resilience in this digital era (Anthopoulos & Vakali, 2012: Desdemoustier et al., 2018). The Smart City phenomenon is a form of digital transformation that apply information communication technology (ICT) processes so that the city can be integrated through good governance, improved quality of life, modern ICT urban system, developed human resources and strengthened the resilience of urban city digital era (Indrawati, 2019). The smart city concept involves policymakers from various fields such as politics, finance, urban planning, and organizations in delivering public services. With ICT, it is hoped that the government can implement a government based on transparent public participation to promote sustainable economic growth and modern infrastructure. According to Devega (2017), a smart city has six main dimensions in its application, namely smart governance, smart branding, smart economy, smart living, smart society, and smart environment. These six dimensions are inseparable from the process of digital transformation and the use of ICT.

Smart governance is one of the dimensions of a smart city that prioritizes government regulations, realizes government administration and government efforts that are transparent to the public, and honest, clean, fair, and require the role of government and society. Smart governance in a smart city can change traditional management systems in public services to quicker, more effective, proficient, communicative, clear and accountable business processes. In brief, digital readiness is a digital transformation process at work, while the smart city is a form of digital transformation in urban planning that uses digital technology. Smart governance uses ICT to change traditional governance to become more modern. Therefore, being digitally ready is necessary to support the execution of smart governance using digital technology in a smart city.

However, the idea of a smart city is still difficult to define due to the nature of the city itself. The definition of a smart city differs and most researchers define the meaning

of a smart city according to their respective context. The concept of a smart city differs due to the geographical locality of the city, the language, culture and way of life of its people in the country. (Indrawati, 2019).

The Ministry of Communication and Information, the Government of Indonesia, held the smart city movement 2020, attended by 100 selected regency or city government officers. Several cities in Indonesia have executed smart city development initiatives due to the central government's encouragement to improve public services through ICT (Fauzi, Nurmandi & Pribadi, 2020). One of the cities that has implemented the smart city concept is Bandung. The city of Bandung has implemented the smart city concept since 2013 and in the Smart City Expo World Congress 2015, Bandung was nominated as the world finalist smart city award in 2015 (Devega, 2017). However, the city of Bandung still has problems in the application, infrastructure, governance, data, and human resources implementation to be a smart city (Mursalim, 2017). In 2020, Bandung implemented the smart city and smart governance strategy as one of the main elements to be a smart city to receive a "Good" score, according to SPBE.Go.id.

In this research, a survey was conducted to gauge the digital readiness of the city of Bandung through its implementation of a smart city and smart governance strategy. This article provides input to the Bandung city government on the digital readiness of implementing a smart city to support its technological developments in the city.

This article is organised as follows: we will begin by reviewing the recent and relevant literature related to smart city. Next, we described the conceptual framework and the methodological used in empirical data analysis. We conclude with some concluding remarks.

2. Bandung Government for Smart City Implementation

Smart cities combine goals with improving quality of life, implement ICT initiatives in urban systems, execute new smart governance processes and focus on human resources development. A smart city is a concept where the adoption of digital transformation is applied so that the city is sustainable in this digital era (Indrawati, 2019). A smart city applies all available technology and resources in a smart and coordinated way to develop an integrated urban center that are liveable and sustainable. In order to build a smart city, a city must be smart city ready. There are several main elements in smart city readiness,

namely natural potential, city structure, infrastructure, superstructure, and culture (Sholeh, Sintaningrum & Sugandi, 2019). For the purposes of this study, researchers focused on only 3 elements, that was structure, infrastructure, and superstructure.

Smart cities are part of the implementation of digital transformation using the Internet of Things (IoT), in Indonesia the objects of the smart city program are the community, government, and infrastructure. In terms of running a smart city in Indonesia, the Ministry of Communication and Information has started building programs for smart cities in Indonesia. Through the Ministry of Communication and Information, the Indonesian government launched the movement smart city 2020, which was participated by 100 selected district/city governments in Indonesia.

Due to the central government's encourages, several local government in the cities of Indonesia have developed the concept of a smart city by utilizing ICT (Fauzi et al, 2020). One of the cities that have implemented the concept of a smart city is Bandung. The city of Bandung has implemented the concept of the smart city since 2013 and in the Smart City Expo World Congress 2015 Bandung City was nominated as a finalist for the world smart city awards 2015 (Suhendra, 2017).

Smart governance is one of the smart city dimensions that prioritizes on improving the government regulation. When smart governance is executed smartly, the traditional bureaucratic processes in public services can be improved to be quicker, more effective, proficient, communicative, clear and accountable. Creating governance that is transparent to the community as well as honest, clean, and fair requires the participation of the government and the community. It involves various stakeholders who participate in making proficient decision in public services (Desdemoustier et al., 2018). According to research by Meijer & Bolivar (2015), Smart governance has 3 main dimensions in its implementation: strategies for implementing smart governance, smart governance arrangements, and outcomes of smart governance. Each of the dimensions of smart governance can be explained as follows:

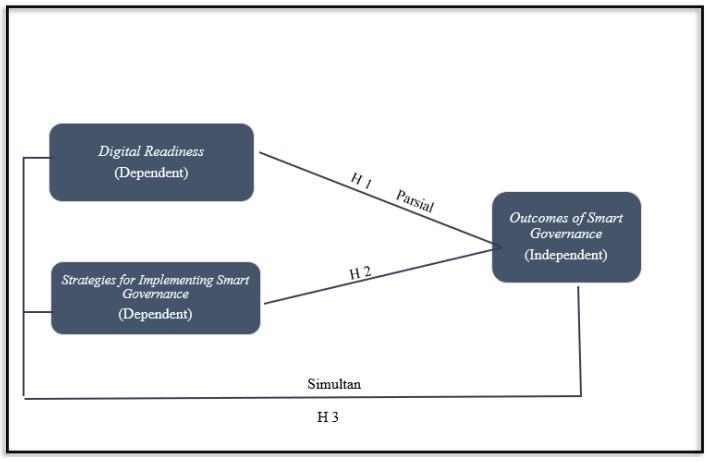
- Strategies for implementing smart governance are actions in different but interrelated domains guided by a comprehensive perspective on smart governance. This action is related to the key indicators to the strategy in implementing smart governance.

- Smart governance arrangements are the main element in executing smart governance processes to establish a smart city.
- Outcomes of smart governance are the result of the implementation of smart governance, which has implemented the dimensions that are the main part of the implementation of smart governance. Moreover, the results of this implementation do not escape the concepts of the smart city themselves that promote change with digital transformation and the use of ICT.

Digital readiness is one of the processes of digital transformation. According to According to Nasution *et* al. (2018), digital readiness is "a stage of development that describes the inclination, desire, and willingness to take action". Hence, digital readiness can be explained as the willingness and tendency to use digital technology for greater innovation opportunities for individuals, firms and industries to achieve their goals. Firms that are digitally ready will generate high revenue and profitability. The revenue and profitability of digitally ready firms are much higher than organizations with lower digital readiness levels.

In this research, the impact of strategies and digital readiness on the outcome of Bandung smart city governance is examined. The Bandung city government plan for the execution of a smart city up to 2025 was initiated in 2017. In this research, the Bandung city government is surveyed by applying the research framework presented in Figure 1.

Figure 1: Research Framework



Source: Researchers

From Figure 1, this study examines two hypotheses, that are:

H1: Digital readiness has a positive influence on the Outcome of Smart governance

H2: Strategies and digital readiness positively influence the Outcome of Smart governance.

3. Methodology

As of May 2021, the civil servant population in Banding is 12,626 people employed in 27 service offices in the Bandung city government. The sample size of this research is 400 respondents, and it is deemed adequate based on the Slovin sample size computation. This research was carried out from March 2021 to May 2021 in the Bandung city area, where 400 Bandung city government employees were surveyed.

According to Meijer and Bolivar (2015), ideas and action strategies were important elements of Smart Governance. Zuntini and Sanchez (2019) established four measurement indicators of digital readiness variables: digital strategy, digital service, dynamic resources and capability, and performance. These items were included in the survey questionnaire of a four-point Likert scale of 'Strongly Agree' to 'Strongly Disagree.' A four-point liker scale is chosen to avoid neutral answers from respondents. See Appendix A for details.

A survey of 400 predetermined samples was surveyed. The F test is used to determine the significance of the independent variable affecting the dependent variable (Ghozali, 2018). The t-test is used to determine the significant influence of digital readiness and smart governance implementation strategies on the outcome of smart governance. In this study, multiple regression analysis is employed to determine the influence between Digital Readiness (X_1) and Strategies (X_2) on the Outcomes of Smart Governance (Y). The aim of this research is to estimate the effect of predictors on the dependent variable.

4. Results and Discussion

Respondents in the male category have a greater percentage than female respondents, with 60.23% of the total respondents. Meanwhile, female respondents got a total of

39.76% from 420 respondents. Furthermore, based on age category, the majority of respondents were 192 people or 45.71% aged 36-40 years and based on years of service, the majority of respondents, as many as 34.76%, were respondents who had worked for 14 to 17 years. The reliability test results of Cronbach's alpha 0.805 indicate good reliability of surveyed data.

The model fit R-value obtained was 0.550. See Table 1 for details.

Table 1: Model fit for Outcome of Smart Governance

R	R square	Adjusted R square	Standard error of estimation
0.550[a]	0.303[a]	0.300	2,373.21704

Note: Predictors are constant, X_1 Digital Readiness, X_2 Strategies

The R value is used to compute the coefficient determination. The coefficient of determination is calculated using the following formula:

$$KD = R^2 \times 100\%$$
$$= (0.550)^2 \times 100\%$$
$$= 30.25\%$$

Thus, the value of the coefficient of determination of 30.25% indicates that Digital Readiness (X_1), Strategy (X_2) have a simultaneous (together) effect of 30.25% on Outcome of Smart Governance (Y). The remaining 69.75% is affected by other factors not observed in this study. According to Ghozali (2018), the simultaneous effect test determines whether the independent variable simultaneously affects the dependent variable. The significance level (α) of 5% with the test criteria used in this research rejected the H_0. See details in Table 2.

Table 2: Simultaneous Hypotheses Results

ANOVA[a]				
Regression	Sum of squares	df	Mean Square	F
Regression	1020559201	2	510279602.1	90.604***
Residual	2348610357	417	5632159.128	
Total	3369169561	419		

Note: a denotes dependant variable, outcome of smart governance. The predictors are constant, X_1 Digital Readiness, X_2 Strategies. *** denotes 1% level of significance.

Based on the output in Table 2, the F value obtained is 90,601, with a degrees of freedom $v_1 = 3$, $v_2 = 420$ (n-(k+1)) and F statistics of 2.626. Since the F value is higher than the critical value, reject H_0. That means the predictors, strategies and digital readiness, will significantly affect the dependent variable, namely the outcome of smart governance.

In addition, there is significant evidence of the predictors' digital readiness and strategies at a 1% level of significance. See Table 3 for details**.**

Table 3: Coefficient Test Results

Coefficients	Unstandardized coefficients		Standardized coefficients	t-statistics
	B	Std. Error	Beta	
Constant	7179.233	1447.862		4.959***
X1 Digital Readiness	0.086	0.010	0.422	8.463***
X2 Stategies	0.237	0.064	0.186	3.738***

Note: *** denotes a 1% level of significance

The t-test is employed to test the effect of variable (X1) Digital Readiness and (X_2) Strategies for executing smart governance to the variable (Y) Outcomes of smart governance. At a 1% level of significance, all predictors were statistically significant to affect the outcomes of smart governance (Y).

6. Conclusion

The effect of digital readiness on the outcome of smart governance is positively significant. The positive and significant t-statistical value indicates that the higher digital readiness will impact the outcomes of smart governance implementation in the Bandung City Government civil servant in realizing the smart city. Bandung City. The results of this study are also following what was conveyed and the framework proposed by previous research regarding digital readiness carried out by (Sanchez & Zuntini, 2019).

Furthermore, the strategy for implementing the outcomes of smart governance is also significant and positively affects the outcome of smart governance in Bandung. The positive and significant t-statistical value indicates that the higher the preparation of the strategy for implementing good strategy will impact the implementation in the outcomes of smart governance in Bandung City Government State Civil servant.

The results of this study support the framework proposed by previous research regarding digital readiness carried out by Meijer & Bolivar (2015). In its good implementation strategy, Bandung has been supported well by government programmes such as the BADAMI (Bandung Discussion and Innovation Monitoring) program in 2020. BADAMI is the master plan for the Bandung City Government work plan in making reference and work guidelines for regional apparatus related to the planning and development smart city of the Bandung City.

Furthermore, the results of the coefficient of determination obtained indicate that 30.25% of strategy for implementing and digital readiness would explain the outcomes of smart governance in Bandung. The result obtained has progressed slightly when compared with what is found by Sugiyono (2019), which states that the vulnerable value of the coefficient of determination is between 0.20-0.399, meaning that variable X has been able to explain variable Y in the study but is in the 'low' category.

Therefore, the Bandung City Government needs to improve digital readiness further, implementing strategies to achieve better smart governance by holding training programmes and preparing information technology infrastructure facilities to support its smart city initiatives. Other activities, including digital competency assessment programmes and focus group discussions within the Bandung City Government to be carried out regularly.

For future research, an in-depth study in all districts and cities in the province of West Java would be able to provide a holistic outlook of digital readiness and smart governance in the West Java region, Indonesia. Other influences or variables that affect the outcomes of smart governance could be a source of future research to find out how other variables might help boost the outcomes of smart governance.

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APPENDIX A

Survey Instrument:

Section A: Outcomes of smart governance

No	Outcome of smart governance	Strongly Agree	Agree	disagree	Strongly Disagree
1	The main result of smart governance is to achieve more efficient governance				
2	The main outcome of smart governance is to achieve citizen-centred services.				
3	The main result of smart governance is to achieve interaction with citizens				
4	The main result of smart governance is to achieve a strong city image				
5	The main result of smart governance is to achieve economic growth				
6	The main result of smart governance is (Smart Governance) to achieve ecological performance				
7	The main result of smart governance is to achieve social inclusion (all individuals and community groups can participate)				

Section B: Strategies for implementing smart governance

No	Strategies for implementing smart governance	Strongly Agree	Agree	disagree	Strongly Disagree
9	I feel the vision of integral for smart city is important				
10	I feel that collaborative governance for smart cities is important				
11	I feel the law is important to evoke a smart city				
12	I feel that policies to promote smart city initiatives and projects are important				
13	I feel that the use of ICT to strengthen smart cities is important				

Section C: Digital Strategy of smart governance

No	Digital Strategy	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
14	My work is based on new ways to collaborate with suppliers*(stakeholders)*				
15	I work relying on the benefits of new ways of collaborating with Communities				
16	I work based on new ways of collaborating with citizens				
17	I work based on new ways of collaborating with private companies				
18	I work based on new ways of collaborating with sponsors				
19	I work based on new ways of collaborating with other public bodies				
20	Increasing citizen engagement is part of my strategy at work				
21	Innovation based on data analysis is part of my strategy at work				
22	Data-driven decision making is part of my strategy at work				
23	The transformation process is part of my strategy at work				
24	In my work I know the needs of the residents/community				

Section D: Digital Service of smart governance

No	Digital services	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
25	My service can be specified and searched electronically				
26	My services can be ordered digitally				
27	My services can be provided digitally				
28	My services can be supplemented or supplemented with valuable information				
29	My services will be threatened by institutions in other industries with which I have relationships, which offer competitive services and eliminate the customer's need for services at my institution.				

30	My services could be at risk of being replaced with other offerings digitally				
31	My ministry can be done digitally in the next five years.				

Section E: Dynamic resources and capabilities of smart governance

No	Dynamic resources and capabilities	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
32	I work using digital technology (social networking, cellular, data analytics, and cloud computing).				
33	I work integrating digital technologies (social networking, mobile, data analytics and cloud computing).				
34	I work by monitoring the needs of residents and other stakeholders.				
35	I am able to respond to threats and opportunities better than employees of other public institutions				
36	My senior officials and I regularly consider the opportunities that data analysis (data mining, OLAP, Big Data) can bring to society				
37	I work by integrating data from various internal sources into a data warehouse *(database)* for easy access				
38	I cultivate data management by integrating external and internal data to produce quality analysis of the business environment I work in, as well as collaborating with other public institutions, citizens, and other members of the ecosystem to share big data and applications.				
39	I cultivate data management by identifying internal opportunities for big data and analytics by evaluating our processes, strategies and people's needs				
40	I cultivate data management by exploring or adopting tools to process unstructured data such as text, video, or images				
41	Data experts, quantitative analysts, data management professionals and I operate effectively in teams to handle big data and analytics projects				
42	The requirements for open data quality publication must be met (in web portal)				

43	The requirements for the number of data publications must be met (in the web portal)				
44	Conditions for the publication of open data must be met (in the web portal)				
45	Conditions for the publication of open data updates must be met (on the web portal)				
46	The requirements for the publication of open data formats must be met (in the web portal)				
47	Project success depends on timeliness				
48	Project success depends on a suitable budget				
49	Project success depends on precise specifications				
50	Project success depends on high quality design				
51	Project success depends on the effectiveness of the project team				
52	Project success depends on the use of solutions				
53	Project success depends on user satisfaction				
54	Project success depends on user benefits				

Section F: Performance of smart governance

No	Performance	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
55	My performance in terms of reduced time to solve the problem has increased in the last two years				
56	My performance in terms of standardized processes and procedures has improved in the last two years				
57	My Performance in terms of Reduction of materials and supplies (e.g., paper, ink, printer, physical space). has increased in the last two years				
58	My performance in Using digital signatures has improved in the last two years				

59	My performance in exchanging data with other public bodies has improved in the last two years				
60	My performance in System reliability (eg, fraud detection, loss of information). has increased in the last two years				
61	My performance in digital services has improved in the last two years				
62	My performance in budget execution has improved in the last two years				