Analysis of Smart Mobility Readiness in Banjarmasin City

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Abstract: The concept of smart city has begun to be widely applied in cities in Indonesia. One city that wants to implement smart city is Banjarmasin. The aim of implementing smart city is to improve public services. One aspect of fulfilling smart cities is smart mobility. Smart mobility in the era is now important because besides requiring comfort, it also requires speed in terms of public services. The purpose of this study is to measure the readiness level of Banjarmasin city smart mobility. The results of this study indicate that the city of Banjarmasin gets a value of 8 with 3 variables in conditional ready conditions,which means that basically the city of Banjarmasin can be said to be ready in the application of smart mobility, but the conditions for repairs and procurement in someaspects of intelligent mobility mentioned the above needs to be fulfilled.

1 INTRODUCTION

With the development of current technology that very quickly makes all aspects of life seem to depend on technology. The community has now used technology as a need that cannot be separated from everyday life. Various technologies are developed including in the field of information technology. Lately in the field of information technology is crowded with the name Smart City concept. Smart City is a concept of development or management of cities with the use of information technology to connect, monitor and control various existing resources in the city more effectively and efficiently. Including by increasing the quality of public services. Various countries have implemented the Smart City concept to meet public needs. Indonesia is no exception. One aspect that you want to build is smart mobility. With the continued increase in the population of vehicles which are causing a lot of problems for the people, namely traffic jams. Smart mobility is one solution to overcome this problem, especially public transportation because travel time is faster with the integration between transportation. Referring to the previous explanation, we need an analysis of how the readiness of smart mobility in the city of Banjarmasin as an aspect in realizing the smart city concept.

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2 REVIEW OF LITERATURE AND THEORY BASIS

2.1 Literature Review

Research related to the analysis of the application of Smart City in Indonesia is still not widely done. However, there are several previous studies related to the application of Smart City, namely research conducted by Malang Widyagama University lecturers named Wiwin Purnowati and Ismini(Purnomowati, 2014). They researched the concept of Smart City and the development of tourism in Malang city. From the research it was concluded that the poor city government seemed to have prepared human resources and infrastructure to implement Smart City. But in its implementation the Malang city government has not implemented the Smart City concept as a whole, as in the Tourism sector. Other research is carried out by FajarP. Pongsapan, Yaulie D.Y. Rindengan, and Xaverius B.N. Najoan (Pongsapan et al., 2014). They examined the architecture of Smart City's information and communication technology network design in the city of Manado. From the research it was concluded that the selection of device specifications used must be considered in order to produce the network quality expected in the application of Smart City in the city of Manado. Furthermore, research on smart mobility in Indonesia has also begun. Several research papers on smart mobility in Indonesia, namely: Alfariani Pratiwi, Soedwiwahjono, and Ana Hardiana

(Pratiwi et al., 2015) conducted research on the availability of smart mobility in the city of Surakarta. The conclusions from their research were Surakarta city is still classified as a conditional ready category which means it can be prepared to implement smart mobility with terms of repairs and additions in several aspects to support smart mobility. By looking at previous studies it can be taken a hypothesis that the readiness of the city of Banjarmasin in aspects of smart mobility, especially in terms of infrastructure is still lacking. To implement the Smart City concept in a region / city, good human resources and infrastructure are needed so that its realization can run smoothly and if there are obstacles, it can be resolved quickly and precisely.

2.2 Theoretical Foundation

2.2.1 Smart City

A city is defined as a 'SMART' city when human investment, conditions and social risks of society, capital / finance, energy resources, transportation, etc., are managed wisely, modernly, participatively and sustainably integrated to ensure a better quality of life (Caragliu et al., 2011). Another source quoted from smartcityindonesia.org (smartcityindonesia, 2015) gave an explanation of Smart City, which is a city that is said to be Smart if the city really knows the state of the city in it, understands the problem more deeply, and is able to take action on these problems. Whereas in the book Introduction and Development of Smart City (Supangkat et al., 2015), smart cities are defined as a concept of developing and managing cities by utilizing Information and Communication Technology (ICT) to more effectively connect, monitor and control various existing resources in the city and efficient to maximize service to its citizens and support sustainable development. So that it can be concluded that Smart city is a development, implementation, and implementation of digital technology (ICT) that is applied to a region / city with the aim of improving service quality in the region and increasing interaction between the government in the region / city and its citizens.

2.2.2 Smart Mobility

One indicator of smart city is smart mobility, which is a movement system that enables the fulfillment of needs with minimal movements as quickly as possible. As for indicators ofsmart mobility, according to Boyd Cohen, there are three, namely Mixed capital access, Prioritized clean and non-motorized options, and integrated ICT.The essence of the movement to fulfill needs is accessibility and mobility, a good movement system is a system with a high level of accessibility and with high mobility. But the level of accessibility and high mobility alone is not enough to say an intelligent movement system, an intelligent movement system is a movement system that minimizes the movement itself.By taking the red thread from the explanation above, smartmobility can be interpreted as a city with a movement system that allows achieving goals with as little movement as possible (less mobility), move freely, and less travel time.

2.2.3 Smart Mobility Indicator

(Giffinger and Pichler-Milanović, 2007)(Cohen, 2012) use the smart mobility indicator as follows:

1. Local Accessibility: The level of readiness of local accessibility is seen from several aspects, namely, public transportation networks, the level of satisfaction with access and the quality of public transportation.

2. Multimodal Access: The level of multi-mode access readiness is seen from the presence of modes integrated between land, rail and air.

3. International Accessibility: The level of international accessibility readiness is seen from access to the airport from within the city of Banjarmasin.

4. Information Technology and Mobility Support Communication: The level of readiness of information technology infrastructure and supporting mobility communication consists of two aspects, namely the availability of smart card systems and their revenues and the availability of real time information.

5. Sustainable and safe transportation: The level of sustainable and safe transportation readiness consists of two aspects, namely aspects of green mobility and traffic safety.

3 RESEARCH METHODOLOGY

The research approach in this research is deductive or commonly called general-specific, namely researchers test research questions derived from theory. The theory is first explained explicitly and then can be continued to test the research question. The data analysis technique used in this study is the scoring analysis technique. The data contained in this study are nominal data that are qualitative in nature, which are then converted into quantitative data by means of scoring. To get the findings done by comparing the results of scoring with the theory and conditions in

the city of Banjarmasin. The analysis techniques carried out include: (1) readiness scoring analysis of the parameters of each variable; (2) City Readiness Analysis of Smart Mobility. The data collection method for this research is literature study for qualitative data and questionnaire spreads for quantitative data. Qualitative data is taken from papers or articles related to smart mobility. Quantitative data is done specifically to get results on the parameters of public transportation satisfaction. To get quantitative data, a survey was carried out on 100 city transportation users in Banjarmasin with 15 questions related to city transportation services. The method used to get the parameters of public transportation satisfaction is the customer satisfaction index (Customer Satisfaction Index) [9] which is an index to measure the level of customer satisfaction based on certain attributes.

4 RESULTS

Parameter	Ready(3)	Conditional Ready (2)	Not Ready (1)
The number of public transportation networks		✓	
Satisfaction with access to public transportation		✓	
Satisfaction with the quality of public transport		✓	
Total		6	

Figure 1: Local Accessibility Readiness Levels.

Figure 1 : In the parameters of the Public Transportation Network and the access authority & quality of transportation in Banjarmasin City gets a value of 6 with an average value of 2 which means it is ready to be conditional. This is because the city of Banjarmasin has public transportation in the form of public transportation, small buses, public taxis, base motorbikes, and online motorcycle taxis.

Parameter	Ready	Conditional Ready (2)	Not Ready(1)
Multimoda Access		✓	
Total		2	

Figure 2: Multimoda Access.

Figure 2: In the multi-modal access parameter, Banjarmasin City gets a value of 2, which means it is ready for conditional. This is because the city of Banjarmasin has an integration of public transport between planes and taxis but there is no train yet.

Parameter	Ready(3)	Conditional Ready (2)	Not Ready(1)
International accessibility		✓	
Total		2	

Figure 3: International Accessibility.

Figure 3: In the parameters of international accessibility readiness the city of Banjarmasin gets a value of 2, which means it's ready for conditional. This is because access to the airport can only use taxis or private vehicles such as cars and motorbikes because there are no trains.

Parameter	Ready(3)	Conditional Ready (2)	Not Ready(1)
Availability of Smart Cards and income from Smart Cards			✓
Availability of access to real-time information			✓
Total		2	

Figure 4: ICT.

Figure 4 : In the parameters of the smart card and realtime information the city of Banjarmasin gets a total value of 2 which means it is not ready. This is because there is no smart card or real time information available in Banjarmasin city.

Parameter	Ready(3)	Conditional Ready (2)	Not Ready(1)
Green Mobility			✓
Traffic Safety		✓	
Total		3	

Figure 5: Local Accessibility Readiness Levels.

Figure 5 : In the parameters of green mobility and traffic safety the city of Banjarmasin gets a value of 1 and 2. In the city of Banjarmasin there are already pedestrians for pedestrians but there is no special track for bicycles. This is because the roads are already very narrow and small.

Parameter	Ready(3)	Conditional Ready (2)	Not Ready(1)
Local Accessibility		✓	
Multimoda Access		✓	
International accessibility		✓	
Information and communication technology to support smart mobilty			✓
Sustainable and safe transportation			✓
Total		8	

Figure 6: Sustainable and safe transportation.

Figure 6 : Based on the results of the research of the 5 variables above, the total value of Banjarmasin city is 8 with 3 variables to determine the readiness of smart mobilty in the category of conditional readiness. So the readiness of the city of Banjarmasin in smart mobility is in a condition of conditional readiness.

Smart Mobility comparison in some cities based on qualitative data collected from varioussources such as the official city government website and national articles :

1. Jakarta

Parameter	Ready (3)	Conditional Ready (2)	Not Ready(1)
Local Accessibility	✓		
Multimoda Access	✓		
International accessibility	✓		
Information and communication technology to support smart mobilty	✓		
Sustainable and safe transportation		✓	
Total		14	

Figure 7: Smart Mobility Readiness Levels.

Figure 7 : Based on the smart city literature study, the city of Jakarta gets a total value of 14 of the 5 measured variables which means that the city of Jakarta is in the category of being ready for the application of smart mobility.

2. Surakarta

Figure 8 : Based on the Surakarta city smart city literature study get a total value of 9 out of 5 variables that are measured which means that the city of Surakarta is in the category of conditional

Parameter	Ready(3)	Conditional Ready (2)	Not Ready(1)
Local Accessibility		✓	
Multimoda Access		✓	
International accessibility		✓	
Information and communication technology to support smart mobilty		✓	
Sustainable and safe transportation			✓
Total		9	

Figure 8: Smart Mobility Readiness Levels.

readiness in the application of smart mobility. Information : The total value for the Ready category: 3 or more variables are in a ready condition The total value to be categorized as Ready Ready: 3 or more variables are in a condition ready for conditional The total value for entering the category is not ready: 3 or more variables are in an unprepared condition

5 CONCLUSION

Based on the aforementioned characteristics regarding each aspect of smart mobility in Banjarmasin City, the scoring analysis of the level of readiness for the application of smart mobility in the city of Banjarmasin received a value of 8 with 3 variables in conditional conditions, which meant that Banjarmasin City was basically ready to implement smart mobility, but the conditions for repairs and procurement in some aspects of the intelligent mobility mentioned above need to be met.

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