ICT-Based Innovation in the Smart City Masterplan and Its Relation to Regional Planning

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Abstract. Masterplan is one of the planning models implemented in Indonesia, including the smart city masterplan. In contrast to the characteristics of the masterplan in general that focuses on products on the physical/spatial the design of smart city masterplan, it is more oriented to strategic planning as an effort to achieve smart city goals. To support this, the smart city masterplan is dominated by ICT-based programs. This paper describes the kinds of smart innovations and its relation with regional planning. The study area consists of two districts which are included in the 100 smart city movements in Indonesia in 2018, namely Blora Regency and Kendal Regency. Commonly smart cities are emphasized in city, but this paper discusses its implementation in regency.

Keywords: ICT, Smart City, Masterplan, Regional Planning

1. Introduction

Indonesia is currently active in implementing various programs and activities to make smart cities come true. One of the programs is the Movement of 100 Smart Cities in Indonesia. It was initiated by the Ministry of Communication and Informatics. There are 100 cities and regencies altogether that are prepared to be smart cities. One of the steps to realize smart cities is by designing the Masterplan of Smart City. Therefore, not only cities are encouraged to be involved in the Movement of 100 Indonesian Smart Cities, but regencies are also encouraged to do so. In relation to the regional characteristics, regencies consist of city areas and mostly rural areas. Therefore, the priority of the development and implementation of a smart city is certainly different.

Smart city must include six dimensions to be called smart, namely smart governance, smart people, smart economy, smart mobility, smart living and smart environment [1]. Meanwhile, the design of Masterplan of Smart Cities in the Movement of 100 Indonesian Smart Cities that is coordinated by the Ministry of Communication and Informatics, the dimension of being smart must include smart governance, smart society, smart economy, smart branding, smart living, and smart environment [2].

In contrast to the characteristics of the masterplan in general that the focus on products on the physical/spatial (city seen physically) and in the process containing problem seeking-programming-designing (action), the design of smart city masterplan is more oriented to strategic planning as an effort to achieve smart city goals. To support this, the smart city masterplan is dominated by ICT-based programs.

This paper is aimed at describing ICT-based applications forwarded by regencies. Especially from Blora and Kendal Regency. Both are included in the Movement of 100 Indonesian Smart Cities.
discussion on ICT-based applications is related to the need of region. This paper also presents the result of identification related to the applications mostly needed and applied in supporting smart regency and regional planning as well.

2. Result and Discussions

2.1 The Concept of Smart City and its Implementation

A smart city can be defined as a city with well-planned performance designed for future period in economic field, society, administration, mobility, environment, and other aspects of life. It is built based on smart combination of endowment and activities of its subjects that are self-reliant, aware, and self-conscious [3]. It is also the one that tries to make itself smarter with the indications of being more efficient, sustainable, fair, and proper to live in [3]. In studying and selecting the concept and designing a smart city, it is necessary to adapt it with the formulated vision and missions of a city. Therefore, it is possible that the implementation of smart city will be different from one city to another. There are several basic components to be a smart city [4]. They are, among others, 1) a city holistic horizon, determining parameter of Smart City for a city, region, or clusters. Smart city takes holistic horizon from all people’s activities in all areas, including city administration, schools, hospitals, infrastructure, resources, and businesses. This needs to be implemented to determine which purpose to achieve. 2) Information and Communication Technology. The use of technology to improve the rate of liveability, workability, and sustainability in a city is to connect and integrate various components of one administration to another (G2G), citizens (G2C), and businesses as well (G2B). The purpose for the government is to obtain the latest evaluation on how a city can function well at any time, prepare technology to anticipate and solve an incident. 3) Data Collection, Dissemination, and Analysis. The use of connected system is to collect data and analyse the present condition of a city. Therefore, it is necessary to have hardware like smart meter or traffic censor to obtain data, and related software to run and filter information. After all information is collected, the data from the censor are communicated through cable or wireless network. The data are then analysed to find out what is happening at present and to anticipate what may happen next.

Several important steps need to be taken to implement to be a smart city [5]. They are; studying the concept and adapting to the city condition, identifying the need and priority of city problems, the smoothness of city operation, and involvement of stakeholders in developing smart city. In relation to identifying the need and priority of city problem, which problems are considered urgent and serious in a city and regency and that it is able to implement in a smart way and therefore they can be identified specifically. That way, a city or regency is expected to be able to focus on solving the problem. In solving a city problem, it is expected to do the planning and implementation of the concept of smart city. After that, it is necessary to search stakeholders to realize those plans. This is a good way to make a well-planned governance. A city is impossible to do all the implementations, operations, and maintenance of city components as it takes a complicated analysing ability. Meanwhile, there are four models for the involvement of stakeholders in developing smart city; First, Building Own model, developing and operating by itself, meaning that city government becomes the main contractor in providing smart city services so that the operation and maintenance of the city is under the control of the city government. Second, Transfer model. In this case, in developing and operating a city, the government let private sectors develop and operate the infrastructure of smart city. Third, Open Business model, meaning that the city government makes a bid for some projects to private sectors. In this case, the city government involves firms that meet the requirements to develop city infrastructure and provide city services under the guidance and regulations designated by the city government. Fourth, Public Private Partnership model. In this case, a city is cooperating totally with private sectors in developing smart city, starting with planning, implementing, and evaluating. Start-up project is implemented to initiate the development of smart city, starting with small scale to large one to avoid the failure of project in developing smart city.
2.2 The Use of ICT and Applications to Support Smart Cities

Smart city is related to spaces for living together among the people who make use of technology, considering that the condition is changing fast as well as the aspects of economic, social, and environmental sustainability [6]. A smart city can also be defined as the one where information and communication technology (ICT) strengthens the freedom to speak and accessibility to public information services [3].

Various innovations in using ICT have been operated to support the application of a smart city. There have been many countries that are successful in implementing smart city. Smart cities do not only deal with the use and development of technology, but they also deal with how the people in a city manage their environment in a smarter way. This is a part of smart city itself. However, it is inevitable that technological aspect also plays an important role in applying smart city.

An example of applying an application is the Smart City Masterplan of Kendal Regency [7]; this is Smart Neighbourhood Security Program. It is a program intended to encourage people to involve themselves in keeping public order, people protection e.g. an obligation to report if a family has some guests over for at least 24 hours, Panic Button (ambulance, natural disaster, crime acts, fire, and any other disturbance), video and audio calls, and SDK. Meanwhile, the aim of the implementation of this program is to provide facility for people to make a fast and responsive report that can be accessed in 24 hours online. The innovation and smart value of this program is a genuine one from this city, the one that is not applied in other cities. It is a program combining system/application, infrastructure, and human resources.

The second application of Kendal Regency is online health service, an android-based application as the result of the development and innovation of the application SIAGA 119. This application is really useful to answer the need of the people for health services and to give fast and real-time response, and to provide fast service for victims because of an incidence. Therefore, there are always officers on duty for 24 hours. The features and ways of health service application to work are; Google Auth for verifying account and minimizing fake information (hoax), One Push for connecting an officer at the call centre of health service online SIAGA as well as transmitting signal GPS in order that the call centre officer can rush to the scene spot accurately, reporting an incident by sing photos or other documentations accompanied with the coordinate of the one reporting it, tracking the location of the one reporting, tracking vehicles (ambulance, police, fire brigade), chatting with officers on WhatsApp, and transmitting signal GPS as well, providing information on the availability of hospital ward, providing information on the availability of blood stock at PMI (Indonesian Red Cross). The information on the closest health service to the users is also equipped with the distance information to the health service, information or news of public health, and information connected to health services in other related regencies. For further development, this application is, in fact, also useful as a reference system for mothers and children. The result of using this application is expected to be able to increase the number of people accessing health and referral services and it results in the implication of the decreasing rate of sickness and mortality, including the mortality rate of mothers and children, as well as improving the rate of life expectancy.

The following is an example of the Smart City Masterplan of the Regency of Blora [8] in which this is Online Admission System for the Information on the Availability of Beds in hospital. The information technology on this health services like hospital can be realized in the form of Hospital Management Information System called SIMRS. Since Android technology has been familiar to people’s daily life, the development of SIMRS based on android is one the forms of innovation that is properly used to improve services to the hospital users. Hospitals often receive complaints from people about refusing a patient in a hospital because there is no more bed available. It is expected that the availability of beds in a hospital can be displayed and accessed by people since there has been transparency from the hospital. In addition, since there in no a special social medium from the hospital to receive complaints from people and slow response from the hospital, they often share their complaint in public social media.
Since the application available is the one that is based on android, those who have no android-based smartphone can still access health services by using queue machine manually through admission office and SMS on the information of the availability of beds in admission section. In this case, officers are required to keep updating data of inpatients on SIMRS because the information of the available beds on application has been integrated to SIMRS so that the information about the available beds can be real time.

The realization of the application of the Smart City concept includes integrating the use of ICT in various aspects of urban development [9]. This also applies to the district. Not all elements in Smart City can be implemented perfectly for the entire city, but needs to look at the conditions, potentials and problems of each [10]. Likewise the application applied to support smart city/smart regency must be adjusted to the needs of the region and OPD (regional implementing organizations)

Along with the increasing use of ICT-based services, it is predicted that in the future ICT will be a determining factor in the decentralization of economic services [11]. The use of ICT is allegedly also reducing movement [12]. Associated with ICT-based government services will also reduce population movements because services can be accessed via the internet. In addition, services can be accessed through sub-districts that are connected virtually with the government at the district level so that people do not need to go to government services in the city centre. In this case decentralization is realized in the form of services that are not only accessible at the centre of government at the district level but shift to lower levels in the sub-district.

3. Conclusion
In making masterplan of smart city, the understanding of the characteristics of the area is very important. Each city has its own characteristics, the same thing applies to regency. In terms of the difficulty in making masterplan of smart city, the main problem is synchronizing between the program and the budget in the masterplan with the Medium Term Development Plan (RPJM). The preparation of this masterplan needs to be synchronized with regional development plans. In addition, the main obstacle in implementing smart city depends on the head of the region/city as well as the human resources of the local government. The head of the region/city should have a strong motivation in planning and handling the implementation of smart city supported by good human resources staff.

In the framework of implementing Smart City in Indonesia, many ICT-based applications have been made to support various dimensions of being smart. In the future, the availability of human resources for the government offices dealing with operating such applications especially in each OPD needs to been taken care of. The digital literacy of the community is also needs improving. This is because they are also a part of stakeholders who make use of the applications available. ICT-based applications need to be designed and implemented well adapted to the needs of the region.

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