

Smart *kampung* for Surabaya smart city: Criteria redefined

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Abstract. There are distinguished characteristics of housing needs in Surabaya based on its process, formal housing and informal housing, so-called with the name *kampung*. These *kampung*s becomes potential to be developed for its local intelligence or technologies in enhance the quality of life of the people living there which gives originalities. This article aims to determine the criteria of smart *kampung* that potentially contribute to make Surabaya closer to become smart city by its originality. This research uses housing and settlement theory, and smart city concepts as the general perspective. The focus areas in this study are located in the central and suburban areas of Surabaya. The method to determine the smart *kampung* criteria are using Confirmatory Factor Analysis and Triangulation method. The results showed there are twelve criteria are as follows: (1) implementation of wastewater and waste management activities, (2) environment quality improvement program, (3) adequate infrastructure, (4) comfortness, (5) the communities' literacy in technology usage for daily activities, (6) basic service provision and efficiency, (7) community empowerment activities, (8) the communities' ability to adopt new things wisely, (9) household-based economic activities or SME, (10) security, (11) access to public facilities, (12) quality of life of society increases in everyday life.

Keywords: *urban kampung, smat city, surabaya*

1. Introduction

Indonesia is a developing country that seeks to improve its living standards in all aspects. In accordance with the agenda continued by the UN after the end of the MDGs agenda, it is time to enter the new agenda of the SDGs. The Sustainable Development Goals which is the development world agenda for the benefit of human and planet earth, which agreed by member countries in the implementation in an integrated manner in their respective countries. Indonesia participated in the implementation of the SDG program. In line with SDGs number 11, cities and sustainable communities, which make cities and settlements inclusive, safe, resilient and sustainable and stated in New Urban Agenda (Convergence of Development Agenda: Nawa Cita, RPJMN, and SDGs, 2015). The New Urban Agenda reaffirms our global commitment to sustainable urban development as a critical step for sustainable development in an integrated and coordinated with the participation of all relevant actors. The implementation of the New Urban Agenda contributes to the implementation and localization to achievement of the sustainable development cities, human settlements and citizen, empowering them to play an active and unique role in development initiatives [1,2]. The city of Surabaya is one of the cities in Indonesia that the city development towards smart city in the field of settlement. Where many urban villages are found that



still try to maintain the existence of the region amid the development of the city to metropolitan. These urban villages need to be utilized to be the hallmark or excellence of urban development, which does not rule out the origin of Surabaya today. This sustainable development can not be separated from the concept of smart city or smart city. The concept of this smart city as an implementation effort of sustainable development. Smart city is a city concept that uses the use of information and communication technology (ICT) to connect, for monitoring and control of various resources within the city effectively and efficiently in order to maximize services to the citizens of the city (Hezberg, 2017; Alawadhi et al., 2012) [3,4].

The city of Surabaya is the largest metropolitan city in East Java Province with the focus of city development towards smart city. The dominance of rapidly growing land use today is a residential area, where settlement areas are spread throughout the region of Surabaya. The extent of settlement land reaches 16,051,51 Ha or 49% from Surabaya City area based on RTRW Surabaya 2014-2034. Nowadays, disparities are often encountered by misperceptions about informal settlements. Where the villages is not wild or slum settlements, but the settlements built by its ingabitants without following the formal building construction of the government based on Bappeko (2012). Urban villages are characteristics of Surabaya City to be maintained by exploiting the city rapid development condition towards smart city [5]. Surabaya is known for its potential development of urban settlements with world-class performance. This is an opportunity in the realization of the city of Surabaya towards the smart city through the field of settlement. Surabaya urban village is the main attraction, where in the development of the city towards the metropolitan, Surabaya City Government and participaton of the community itself does not rule out the existence of the urban kampung. Which is the uniqueness of the city of Surabaya in the development of cities in the field of settlements that utilize the local potential to create an urban village that is inclusive, safe, resilient in accordance with the results of convergence in order to realize a sustainable urban village. The city of Surabaya has a thematic village, where the villages have been nurtured and have been used as pilot villages which move and develop independently with the supervision made by the city government. This thematic village has a diverse range of fields, both in the economic, social, and cultural fields, where the need for a standardized needs in other areas to become thematic villages is resilient not only rely on one field only. To achieve this, the need for intelligent settlement criteria in the village thematic in realizing Surabaya smart city [6].

2. Methods

The research variable used is the adaptation of smart city theory and adapted to residential area in Surabaya, which is found as follows. Type and number of industry, industry condition, type and number of entrepreneurship, entrepreneurship condition, level of creativity/business innovation, condition of study location, economic contribution to other administrative scope, technological conscious condition, internet usage condition, condition of facility, condition of infrastructure, the condition of the passing vehicle, the regulatory conditions applied to the area, the availability of facilities, the availability of infrastructure, the coordination of citizens regarding environmental management, the level of education, the type and number of activities, the existing activity conditions, open mind, the type and number of reporting related to crime, criminal condition, health facility, educational facility, public building facility, tourism activity condition, social integration condition with adjacent territory, community condition, number of government service via online, access number or visitor of government service page, and condition of public response to government service via online.

2.1 Identifying the characteristic of smart activities and technology in urban kampung of Surabaya

Qualitative descriptive analysis is an analysis used to provide an overview of the potential area of study in depth accompanied by discussions that are tailored to the related theories. This analysis outlines the basics of each data variable that belongs to the category in each indicator and dimension concept. The data collected needs to be presented with communicative and informative to be easily understood by others. The resulting potential data will be specific and can be comparable to the variables in each settlement according to different potentials between one settlement with another.

2.2 *Perceptual mapping of smart kampong preference towards Surabaya smart city*

Confirmatory Factor Analysis is used to identify the factors that influence the determination of smart village criteria in Surabaya, then this analysis will reduce some variables that are not used in the research. Confirmatory Factor Analysis uses SmartPLS 3.0 software support with the steps in the analysis as follows.

1. Grouping of variables based on factors that match the literature review.
2. Conduct analysis of each factor using SmartPLS 3.0 software assistance, the factors in the research variables can be said valid when the validity test, reliability test, and significance test meet. The validity requirements (value of standardize loading factor above 0.5 are acceptable), reliability test (value of cronbach's alpha ≥ 0.5 , composite reliability value ≥ 0.7 , and AVE value ≥ 0.5), and the significance test (p-values ≤ 0.05 and t-statistic value ≥ 1.96), whereas if the values are not met then the factor is invalid [4].

2.3 *Determining the smart kampong criteria towards Surabaya smart city*

In determining criteria of intelligent settlement in Surabaya City based on the prioritized aspects of using qualitative descriptive analysis with triangulation validation. In doing this method of analysis is done by comparing between the results of analysis in quantitative and qualitative to be tested against experts according to the character of settlements in the city of Surabaya.

3. Results

There are influenced variables according to the case study area, Kampung Margo Rukun dan Kampung Lawas Maspati described in Table 1.

Tabel 1. Influencing Variabels in Case Study 1: Kampung Margo Rukun

Smart City Dimensions	Research Variable
Smart Economy	Quantity and classification of industry
	Quantity and classification of entrepreneurship
	Climate of entrepreneurship
	Economic contribution to another districts
Smart Mobility	Technology awareness
	Internet usage
Smart Environment	Availability of public space facilities
	Availability of waste management
Smart People	Level of education
	Openess
	Types of activities
Smart Living	Health facilities
	Education facilities
	Community characteristic
Smart Governance	Online-based public service
	Number of online access

Tabel 2. Influencing Variabels in Case Study 2: Kampung Lawas Maspati

Smart City Dimensions	Research Variable
Smart Economy	Quantity and classification of industry
	Climate of industry
	Quantity and classification of entrepreneurship
	Climate of entrepreneurship
Smart Mobility	Technology awareness
	Internet usage
Smart Environment	Environment management coordination
Smart People	Level of education
	Types of activities
Smart Living	Health facilities
	Education facilities
	Community characteristic
Smart Governance	Online-based public service
	Number of online access

It is known that the variables affecting each village represent the character of the community and the picture of a village in everyday life to find out how far the urban village is preparing to face the city's development [5].

In determining the criteria of Smart Village to Surabaya smart city requires comparison with related parties regarding the data that have been obtained, that is the side of government and academia that aim to get the criteria that can represent the common interest. The process through which this triangulation stage corrects the criteria by adjusting the plans that have been drafted by the government and ideally a criterion by theory by academic experts (described in Table 3).

Tabel 3. Determination of Urban Village Development Criteria Toward Surabaya Smart City

Criteria for Smart Village Development in Kampung Margo Rukun	Criteria for Smart Village Development in Kampung Lawas Maspati	Criteria for Smart Village Development in Surabaya
Household-based economic activity by matching technology development (internet)	Household-based economic activity by inserting technology-based activities (internet)	There is household-based economic activity (achieved when economic activities are conducted on a technology basis ie the internet)
Criteria of convenience: accessibility, ease of communication: internal / external or direct or indirect, as well as ease of activity: environmental facilities and facilities available.)	Comfort criteria (achieved with ease of achievement: ease of accessibility, ease of communication: internal / external or direct or indirect, and ease of activity: available environmental and environmental facilities.)	There are convenience criteria (accomplished with ease of achievement: accessibility, ease of communication: internal / external or direct or indirect, and ease of activity: available environmental and environmental facilities.)

Criteria for Smart Village Development in Kampung Margo Rukun	Criteria for Smart Village Development in Kampung Lawas Maspati	Criteria for Smart Village Development in Surabaya
People are able to apply the use of technology (internet) in daily activities	The community is able to implement the use of technology (internet) in daily activities	The community is able to implement technology usage (achieved when the use of technology in general and the internet is specifically used in daily activities)
Condition of good infrastructure (full of completeness of environmental facilities and facilities in the work)	There are environmental quality improvement programs by environmental and community facilitators	There is adequate infrastructure (expressed by the completeness of infrastructure and facilities both environmentally and publicly)
Implementation of waste water and waste management activities	Community empowerment activities in village development (expressed participation in program training)	There is implementation of waste water and waste management activities (achieved based on records of activities held by the village)
Community empowerment activities in village development (of course participation in training programs)	Security criteria (achieved by dealing with reports related to crime and current conditions)	There are environmental quality improvement programs by environmental and community facilitators (achieved on the basis of participation or activities held by the village)
Community processes accept new things in adaptation	Criteria for affordability of distance to public facilities (achieved by taking into account the distance of the ideal achievement of a person's walking ability as an environmental user against the placement of environmental facilities and infrastructure)	There are community empowerment activities in village development (expressed by participation in training of village development programs)
Criteria for affordability of distance to public facilities (capacity with distance capability ideal ability of people walking as environmental users to the placement of environmental facilities and infrastructure)	The quality of life of society increases in everyday life (achieved with a sense of self-satisfaction)	Society processes acceptance of new things in adaptation
The quality of life of society increases in everyday life (satisfaction with a sense of self-satisfaction)	Targeted service criteria (expressed the effectiveness of accessing services)	There are security criteria (viewed based on the crime report and the condition of facilities and infrastructure of response to disaster)
Targeted service criteria (benefit of service access effectiveness)		There is a criterion of affordability of distance to public facilities (achieved by

Criteria for Smart Village Development in Kampung Margo Rukun	Criteria for Smart Village Development in Kampung Lawas Maspati	Criteria for Smart Village Development in Surabaya
		taking into account the distance of the ideal achievement of a person's walking ability as an environmental user against the placement of facilities and infrastructure)
		The quality of life of society increases in everyday life (achieved with a sense of self-satisfaction)
		There is an appropriate target service criteria (expressed the effectiveness of accessing services by the community)

The result of this research is the criteria for the development of urban kampung to Surabaya Smart City, where there are 12 criteria that should be owned by the village to survive and adapt the development in Surabaya. The 12 criteria: there are implementation of waste water and waste management activities, there are environmental quality improvement program, there is adequate infrastructure, there are criteria of comfort, the community is able to implement technology usage in everyday activities, there are criteria of service target, there are community empowerment activities, the community processes accept new things in the adaptation, there are household-based economic activities, there are security criteria, there are criteria of affordability of distance to public facilities, and the quality of life of society increases in everyday life.

4. Conclusion

In this study aims to determine the criteria of urban village development in Surabaya based on the adaptation of the smart city concept. The following are the results obtained from this study which are 12 urban village development criteria:

1. The existence of waste management activities to enhance the environment quality
2. The availability of adequate infrastructure for a safe and secure living environment
3. The involvement of people in participatory planning and management and its technology application
4. The existence of Small-Medium Enterprises (SME) which involving technology application
5. The availability of technological-based community integrated service
6. The accessibility of internet and digital infrastructure that is effective.
7. There are community empowerment activities in village development
8. Society processes acceptance of new things in adaptation
9. There is household-based economic activity
10. There are security criteria
11. There is a criteria of affordability of distance to public facilities
12. The quality of life of society increases in everyday life

5. References

- [1] UNDP, Indonesia, 2015, *Konvergensi Agenda Pembangunan: Nawa Cita, RPJMN, dan SDGs*, Jakarta.
- [2] UNHABITAT, 2017, *New Urban Agenda*, United Nations.

- [3] Herzberg, C 2017, *Smart Cities, Digital Nation: How Digital Urban Infrastructure Can Deliver a Better Life in Tomorrow's Crowded World*, Roundtree Press, United State.
- [4] Sutriadi, R 2017, *Media Sosial dalam Perencanaan Kota*, ITB Bandung.
- [5] Rahmawati, D. & Supriharjo, R 2012, 'Identifikasi Karakteristik Eksternalitas Perumahan di Kota Surabaya'. *PWK ITS Jurnal Penataan Ruang*, vol. **7**, no. 2.
- [6] Albino, V, Berardi, Umberto, Maria, D & Rosa, 2015, 'Smart Cities: Definitions, Dimensions, Performance, and Initiatives', *Journal of Urban Technology*, vol. 1, 3-21.
- [7] Department of Spatial Planning, Vienna University of Technology, Vienna, Austria, dilihat pada tanggal 23 Oktober 2016, <http://smart-cities.eu/>.
- [8] Paramasatya, D & Rahmawati, D 2017, *Penentuan Variabel Berpengaruh terhadap Pengembangan Kampung Cerdas dalam Mewujudkan Konsep Smart City*, Surabaya.
- [9] Paramasatya, D 2017, *Penentuan Kriteria Pengembangan Kampung Cerdas di Kota Surabaya Dalam Mewujudkan Konsep Smart City*, Surabaya.

Acknowledgments

Authors wishing to acknowledge assistance or encouragement from Department of urban and Regional Planning of Institute Technology Sepuluh Nopember for the research funding and the opportunity to cooperation with important stakeholder in Surabaya Smart City concept.