

## SMART CITY VS SMART VILLAGE

Fajrillah<sup>1</sup>, Zarina Mohamad<sup>2</sup>, Wirda Novarika<sup>3</sup>

<sup>1</sup>Manajemen

<sup>2</sup>Fakulty of Informatics dan Computing

<sup>3</sup>Teknik Informatika

<sup>1</sup>Sekolah Tinggi Ilmu Ekonomi IBBI, Jl. Sei Deli No.18, Medan, Sumatera Utara 20236 Indonesia

<sup>2</sup>Universiti Sultan Zainal Abidin, Gong Badak, 21300 Kuala Terengganu, Terengganu, Malaysia

<sup>3</sup>Sekolah Tinggi Teknik Poliprosesi, Jl. Sei Batang Hari, Medan, Sumatera Utara 20119, Indonesia

<sup>1</sup>fajrillahhasballah@gmail.com, <sup>2</sup>zarina@unisza.edu.my

### ABSTRACT

Currently, research on the theme of smart city and smart village continues to be done. This study aims to determine the comparison of characteristics of smart cities, and smart villages. The benefit of this research is to know the characteristics, what is needed by smart city, and smart village to be able to answer the need for smart city, and smart village. The needs of the city are smart, and the village is smartly different, but there are standards. To create economic balance and economic growth, it is necessary to focus on creating intelligent systems, in order to promote overall economic growth.

**Keywords:** Smart City, Smart Village, Characteristics, Comparison.

### I. INTRODUCTION

That between 2015 and 2050 the world population will increase by 32%, the United Nations estimates, from 7.2 to 9.7 billion residents, significant growth will occur in Africa, Asia and Latin America, the population will be concentrated in the cities (United Nations, 2015) (United Nations, 2014). [1][2].

Rural population migration to the city has become a necessity for urbanization in the hope of getting a better life, such as work, education, medical care, access to culture and so on). Migration often occurs from poor countries or under social and military conflicts, industry. Because of that condition, by 2050, India will reach 1.7 billion people, with the city of Mumbai (42 million) and New Delhi (36 million), China will be stable at 1.34 billion inhabitants, with the Shanghai city (21 million), while Nigeria and Indonesia each reaching 399 million people (United Nations, 2015). [1]

By 2050, the global population is expected to grow to over nine billion, and 80 percent of that population will reside in cities. Today, cities are home to just over half of the global population of seven billion. Meanwhile, cities comprise just two percent of the Earth's land mass and are responsible for the consumption of 80 percent of the Earth's resources. The accelerating growth of cities and their disproportionate consumption of physical and social resources are unsustainable, as are the traditional systems cities rely upon to deliver resources. While urbanization continues to

contribute to the increase in carbon emissions globally, local action is critical to achieving a low carbon future. In the absence of binding international climate measures as well as limited leadership in many state governments, the city is now undertaking and develops strategies to tackle the effects of climate change. The city is the best hope to tackle climate change. ICT, large data and "smart" technology are present as potential tools to reach the future of underprivileged citizens (Elliot et al., 2015). [3]

Urbanization continues to increase, making cities more complicated, new methods of creating, communicating and using data keep emerging, information, infrastructure becoming increasingly interconnected and issues becoming increasingly complex. Many cities use digital systems to communicate with communities and stakeholders, utilizing data and information for planning, services, and hone the digital skills needed to participate in society and become economically successful. In order for the city to be smart and sustainable - more eco-friendly, prosper economically, and socially - cities should integrate the use of large data, and ICTs into daily processes and in pursuit of urban urgent goals (Elliot et al., 2015). [3]

Many people will leave their villages and go to the city, because the village is considered hopeless and the city provides a dream. Not only moved to the city, the lack of economic activity in the village also caused some villagers to work as migrant workers and migrant workers abroad. In fact, working abroad also does not guarantee life

to be better. With the development of the village, may urbanization be reduced. Even villagers in the city can return to the village, if the village is developed (SekretarisJenderalKementerianDesa, 2017).[4]

The concept of smart villages that focus on rural areas and communities by building on their current strengths and assets and developing new opportunities. In smart villages, traditional and new networks and services are enhanced through better digital technology, telecommunications, innovation and knowledge use, for the benefit of rural communities and businesses. Digital technology and innovation can support quality of life, higher living standards, public services for citizens, better use of resources, smaller environmental impacts, and new opportunities for rural value chains in terms of better products and processes. The concept of smart villages does not propose a one-size-fits-all solution. This is regionally sensitive, based on the needs and potential of each region and its strategy, supported by new or existing territorial strategies. Important technologies such as investment in infrastructure, business development, human capital, capacity and community development. Good government and citizen engagement are also important (Phil, 2016).

## II. THEORY

### A. Why Smart Cities And Smart Villages

Smart Cities or Smart villages? Can smart villages be a solution for Climate change effects in developing nations?. There is a new era of smart cities, all developing countries determined to build their city smartly to be sustainable and tough. India has launched an intelligent city project. Developing nations should be focusing more to their villages and try to curb the urbanization growth. More urbanization means more sealed opportunities, more pollution, less land absorption capacity. Most of the developing nation has urbanization level in the range of 25-50% of their total area. Why not preserve the village area, create jobs, equip them with sustainable measures. The village is more sustainable and tough than the city (Himanshu, 2015).[6]

#### Why concentrate on villages?

- Lack of rural employment opportunities and unprofitable farming (except in the case of large landholdings) forces village youth to migrate to cities. There, many of them are not enjoying a decent quality of life because they can only get jobs that do not get a decent wage.
- In the cities, uncontrolled migration adds to pollution, traffic problems, crime, and over-

burdening of civic amenities and infrastructure. Therefore it is natural that for 'inclusive' development, the Government must focus on them (IAS4Sure, 2016). [7]

India has built a reputation as a global leader in pursuing smart city initiatives in wider urban areas. But critics fear that most Indians still live in the village. Villages have become forgotten, in a hurry to turn large cities into connected cities, and this not only in India but also in densely populated countries, and slow-growing economies (Donal, 2016). [8]

### B. Comparison

Where smart cities develop, there is a big challenge in deconstructing the concept of smart city into explicit characteristics. These characteristics can offer an overview of the options and guidelines available to policymakers involved in smart city development.

Within the framework of an intelligent city represents the conceptual model of urban development based on the following:

- a. The utilization of human capital,
- b. Collective,
- c. Technology for developmental improvement,
- d. Prosperity in urban agglomeration (Margarita, 2014). [9]

Today the tools and technologies available in smart cities fall into these three categories:

- (1) Tools and technologies for collection and management of Geo-data across cities (location-based services, cloud computing, Internet matters, sensor networks, data warehouses, Geographic Information Systems, Geo-visualization, mapping, etc.);
- (2) Tools and technologies for public participation (web-based participatory tools, crowdsourcing platforms, Live Labs, social media), and,
- (3) Sectoral applications (e.g., transportation, energy, environment, etc.) (Stratigea et al, 2015).[10]

ICT-based initiatives are able to handle a very wide range of urban challenges (Nijkamp and Cohen, 2013).[11]

Tsarchopoulos et al. (2017) argued that a combination of testing applications with cloud computing could significantly speed up smart city uptake (Tsarchopoulos et al, 2017).[12]

Provides a comprehensive overview of the areas handled through smart city applications:

- (1) Economic activity: manufacturing, trade, business and finance, education, research, health, and tourism,
- (2) Municipal infrastructure and utilities: transportation, energy, water, sewage, ICT,
- (3) Quality of life: social inclusion, social care, orderly and safe, environmental warning,

- (4) Municipal governance: municipal services, citizen participation, providing information for top-level decision making, monitoring, and benchmarking (Komninos, 2011).[13]

Inspired by the challenges of smart city development, the following is an attempt to identify the main characteristics of smart cities, namely:

- a. Technology, ICTs, and the Internet
- b. Human and Social Capital Development
- c. Entrepreneurship Promotion
- d. Global Collaboration and Networking
- e. Privacy and Security
- f. Locally Adapted Strategies
- g. Participatory Approach
- h. Top-Down Coordination
- i. Explicit and Workable Strategic Framework
- j. Interdisciplinary Planning(Margarita, 2014).

[9]

Characteristics that define "smart city", there are six namely:

1. Undoubtedly the incorporation of information and communication technology (ICT) into public services is the main thing. In a true smart city the use of technological platforms must be easily accessible through various devices and the connections on these must be swift, as these are part of their public services.
2. Efficient public services are the other point of honor in this new urban concept. Adequate collection of solid waste, ease of recycling, management of renewable energy, among others are the minimum services with which it must count to be cataloged as such.
3. The protection and security of its citizens is another essential aspect. In a "smart city" the networks of camcorders, highway and street lighting, intensive surveillance and patrolling, and a fast response system for emergency calls are key requirements.
4. Financial independence is another interesting feature. Smart cities have strategic planning of all their sources of income: taxes, payments, government budget, etc.
5. Smart cities have a social infrastructure suited to their requirements. This means that their schools, hospitals, recreational areas, and communication routes are sufficient and efficient.
6. Traffic planning is, almost by definition, another feature of this type of city. An efficient public transport network that reduces energy consumption and the enabling of bicycle paths are among the parameters to be met. Therefore, in smart cities the use of private transport is reduced, so the famous traffic jams (peak hours) are something of

another century (La Cuisine International, 2017). [14]

Quoted from ECM TechNews blog, 6

Characteristics to understand the concept of Smart City, namely:

1. Smart energy.
2. Smart data.
3. Smart transport.
4. Smart Infrastructure.
5. Connected devices.
6. Connected mobility(ECM TechNews, 2017). [15]

The main focus of smart villages as a driver of growth is the role of ICT infrastructure, human capital / education, social and relational capital and environmental factors. Village performance depends on hard infrastructure (physical capital), and increasing availability and quality of knowledge, communication & social infrastructure (intellectual capital and social capital). A smart village has investments made in human and social capital in addition to physical capital (Viswanadham, 2014).[16]

Smart cities are one of those things that seem to be a natural policy to adopt and they can bring improvements if done right. There are many ways that technology can be applied to improve the lives and livelihoods of citizens in the city. The town and village where you are. Many technologies, now present Internet Things, but also include security, data analysis, cloud computing, and mobility.

Trevor et al. Eight traits that are part of every smart city strategy. Indeed, this is not an exhaustive list, but the basis considers the characteristics of an intelligent city:

1. Inclusive: This principle is arguably the most important. Every safe and intelligent city plan must begin by bringing everyone into the wishes, hopes and needs of society, regardless of social status, they are part of the city where they live.
2. Proactive: Vision and strategy must be proactive and not reactive
3. Adjusting: The only technological regret is everything will change and fast.
4. New approaches, new technologies, or new business models can positively interfere with how we do things, have to adapt quickly.
5. Sustainable: Every safe and smart city should have a three-sided approach to sustainability: Economic, social, and environmental sustainability
6. Human-centric: All safe and intelligent city developments should center on serving all who live in the city and should take precedence. This will always produce the best results.

7. **Maintain:** A safe and smart city is a living ecosystem - they enable people, families, and communities to live the lives they want to pursue. They defend the best human ambitions regardless of who they are, where they come from, and where they are going. Smart City helps people play, live, learn, work, and grow. An important part of this is giving people accurate information and allowing different entities to collaborate.
8. **Transparent:** Safe and smart cities encourage open, transparent and honest two-way participation between governments and citizens.
9. **Safe:** The cornerstone of any smart city is public security - the ability to ensure that all its citizens, the economy, and its infrastructure is safe in all sense of the word (Trevor, 2017). [17]

By producing high value added agriculture and rural industrial products for export to national and international markets and goods and services to the local rural market, smart villages can equip smart cities as an engine of economic growth. In addition, smart villages can be the stewards of the environment, ensuring that their development can be achieved sustainably with regard to the impact on the local environment. The following paragraphs describe the generic features - the actual realization of the concept of smart villages will vary according to country, region and specific context, namely:

1. Education.
2. Health.
3. Food security.
4. Productive enterprise.
5. Environment.
6. Participatory Democracy.
7. Quality of Life (Terry et al., 2015). [18]

Smart Village aims to provide policymakers, donors and development agencies concerned with rural energy access with new insight into the real barriers to energy access in villages in developing countries - technology, finance and politics - and how it can be overcome. We chose to focus on remote off-grid villages, where local solutions (home-based systems or institutions, and mini networks) more realistic and cheaper than the national grid network. It needs Attention that energy access leads to the development and creation of 'smart villages' where many of the benefits of life in modern society are available to rural communities (Terry et al., 2015). [18]

An intelligent village is a collection of services provided efficiently to villagers and businesspeople. This service is a specific location depending on the demography of the village and the work of the population. Requires strategies,

integrated planning and monitoring and implementation of activities using appropriate governance models.

The basic concept of smart villages is to gather the efforts and strengths of people from different streams and integrate them with information technology to benefit the rural communities. According to Mahatma Gandhi's philosophy and thought, Smart village projects provide, "Global means local needs".

Services needed for smart villages,

1. Food security.
2. Democratic Engagement –
  - a. Good governance,
  - b. Social development.
3. Health prosperity –
  - a. Environmental development,
  - b. Personal development.
4. Education - The basic knowledge for awareness.
5. Local business - economic development (Rutuja et al., 2016). [19].

Smart Village Requirements

1. Smart Security.
2. An efficient public transport system.
3. Improving sanitary conditions
4. Management of solid and liquid waste.
5. Rain Harvesting / Rainwater drainage system.
6. Safe drinking water facilities.
7. Use of renewable energy.
8. Energy conservation.
9. The resignation of the complaint.
10. Strengthening CBO.
11. Functional bank account.
12. Facilities related to agriculture.
13. Latest & Affordable medical facilities.
14. E-governance.
15. Use of modern technology to improve locality.
16. Increasing women's empowerment.
17. Educational facilities (Rutuja et al., 2016). [19].

### III. Conclusion And Recommendation

From this study, it can be concluded Smart city can bring improvements if done correctly. There are many ways that technology can be applied to improve the lives and livelihoods of citizens in towns and villages or wherever located. In order for smart and sustainable cities - more eco-friendly, economically, and socially-prosperous the city should integrate the use of large data, and ICT into the processes of everyday life and in the pursuit of urban development urgent goals.

However, in creating an economic balance and economic growth, it is necessary to focus on the

creation of smart villages to foster overall economic growth. "Without making the village smarter, the nation cannot grow and be progressive". The concept of a smart village does not propose a one size solution suitable for all villages. Good government and citizen engagement are also important in building smart villages. The main focus of smart villages as a growth driver is the role of ICT infrastructure, human capital / education, social and relational capital and environmental factors.

Rural energy access makes the village different from the city, the unique characteristic difference between smart cities, and smart villages lies in the development of intelligent energy access. Why focus on the village, the village is more sustainable and tough than the city and the needs of intelligent system infrastructure in the village is not as complex as the city.

#### IV. ACKNOWLEDGMENTS

The authors gratefully acknowledge financial support from Research Management, Innovation and Commercialization Center (RMIC), under the project UNISZA/1/2015/SRGS/5.

#### V. REFERENCES

- [1] United Nations, World Population Prospects. The 2015 Revision: Key Findings and Advance Tables, 2015.
- [2] United Nations, World Urbanization Prospects. The 2014 Revision: Highlights, 2014.
- [3] Elliot Bent, Michael Crowley, Melanie Nutter, Claire Wheeler, Lindser Chamberlin, Getting Smart About Smart Cities, 2015. <https://static1.squarespace.com/static/531e766be4b030d9a20a99e1/t/5581e084e4b06eb9aea8dcd3/1434574980711/Smart+Cities+RG.pdf>
- [4] Sekretaris Jenderal Kementerian Desa, Ancaman Urbanisasi, Pengembangan Desa Butuh Intervensi, 2017. [http://www.kemendesa.go.id/view/detil/2086/ancaman-urbanisasi-pengembangan-des-butuh-intervensiresearch.searchleasier.com/?uc=20170326&ap=appfocus5&source=googledisplay&uid=bb42ff71-b721-4f18-8025-024a4e580f02&i\\_id=email\\_3.2&page=newtab&](http://www.kemendesa.go.id/view/detil/2086/ancaman-urbanisasi-pengembangan-des-butuh-intervensiresearch.searchleasier.com/?uc=20170326&ap=appfocus5&source=googledisplay&uid=bb42ff71-b721-4f18-8025-024a4e580f02&i_id=email_3.2&page=newtab&)
- [5] Phil Hogan, Corina Crețu, Violeta Bulc, EU Action for SMART VILLAGES, 2016. [https://ec.europa.eu/agriculture/sites/agriculture/files/rural-development-2014-2020/looking-ahead/rur-dev-small-villages\\_en.pdf](https://ec.europa.eu/agriculture/sites/agriculture/files/rural-development-2014-2020/looking-ahead/rur-dev-small-villages_en.pdf)
- [6] Himanshu Raj, Smart Cities or Smart villages? Can smart villages be a solution for Climate change effects in developing nations?, 2015, [https://www.researchgate.net/post/Smart\\_Cities\\_or\\_Smart\\_villages\\_Can\\_smart\\_villages\\_be\\_a\\_solution\\_for\\_Climate\\_change\\_effects\\_in\\_developing\\_nations](https://www.researchgate.net/post/Smart_Cities_or_Smart_villages_Can_smart_villages_be_a_solution_for_Climate_change_effects_in_developing_nations)
- [7] IAS4Sure Notes, Smart Villages: We need smart villages more than smart cities, 2016. <http://www.ias4sure.com/ias4sure-notes/smart-villages-we-need-smart-villages-more-than-smart-cities/>
- [8] Donal Power, India Needs Smart Villages, Not Just Smart Cities, 2016. <https://readwrite.com/2016/04/21/india-needs-smart-villages-not-just-smart-cities/>
- [9] Margarita Angelidou, The Role of Smart City Characteristics in the Plans of Fifteen Cities, Journal of Urban Technology, 2014, [https://www.researchgate.net/profile/Margarita\\_Angelidou2/publication/319165021\\_Angelidou\\_M\\_2017\\_The\\_Role\\_of\\_Smart\\_City\\_Characteristics\\_in\\_the\\_Plans\\_of\\_Fifteen\\_Cities\\_Journal\\_of\\_Urban\\_Technology\\_1-28/links/59e1bee3a6fdcc7154d7d723/Angelidou-M-2017-The-Role-of-Smart-City-Characteristics-in-the-Plans-of-Fifteen-Cities-Journal-of-Urban-Technology-1-28.pdf](https://www.researchgate.net/profile/Margarita_Angelidou2/publication/319165021_Angelidou_M_2017_The_Role_of_Smart_City_Characteristics_in_the_Plans_of_Fifteen_Cities_Journal_of_Urban_Technology_1-28/links/59e1bee3a6fdcc7154d7d723/Angelidou-M-2017-The-Role-of-Smart-City-Characteristics-in-the-Plans-of-Fifteen-Cities-Journal-of-Urban-Technology-1-28.pdf)
- [10] A. Stratigea, C. A. Papadopoulou, and M. Panagiotopoulou, "Tools and Technologies for Planning the Development of Smart Cities," Journal of Urban Technology 22: 2, 2015, 43–62.
- [11] P. Nijkamp and G. Cohen-Blankshtain, "The Importance of ICT for Cities: e-Governance and Cyber Perceptions," in J. Klaesson, B. Johansson, and C. Karlsson, eds, Metropolitan Regions: Knowledge Infrastructures of the Global Economy (Berlin: Springer, 2013) 295–308.
- [12] Tsarchopoulos, N. Komninos and C. Kakderi, "Accelerating the Uptake of Smart City Applications through Cloud Computing", World Academy of Science, Engineering and Technology, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 11:1, 2017, 129–138.
- [13] Komninos, "Intelligent Cities: Variable Geometries of Spatial Intelligence," Intelligent Buildings International 3: 3, 2011, 172–188.

- 
- [14] La Cuisine International, 6 CHARACTERISTICS THAT DEFINE SMART CITIES, 2017, <http://inspiringgoodliving.com/6-characteristics-define-smart-cities/>
- [15] ECM TechNews, Top 6 Characteristics to Understand the Concept of Smart City, 2017, <http://ecmapping.com/2017/03/31/top-6-characteristics-to-understand-the-concept-of-smart-city/>
- [16] N. Viswanadham, Design of Smart Villages, 2014, <http://drona.csa.iisc.ac.in/~nv/95DesignofSmartVillages-IISc.pdf>
- [17] Trevor Clarke, 8 Characteristics of a Safe and Smart City, 2017, Tech Research Asia, <http://techquarterly.asia/node/100>
- [18] Terry van Gevelt, John Holmes, A Vision for Smart Villages, e4sv.org, 2015, <http://e4sv.org/wp-content/uploads/2015/08/05-Brief.pdf>
- [19] RutujaSomwanshi, UtkarshaShindepatil, Deepali Tule, ArchanaMankar, Namdev Ingle. Guided By- Dr. V. S. Rajamanya, Prof. A. Deshmukh, Study and development of village as a smart village, International Journal of Scientific & Engineering Research, Volume 7, Issue 6, June-2016. , page 395-408.