



**3rd International Conference
on Public Policy (ICPP3)
June 28-30, 2017 – Singapore**

Panel T09P04 Session 2 Smart cities in Asia II

Smart Cities in Asia

Title of the paper

Smart City Narrative in Indonesia:

Comparing Policy Documents in 4 Cities

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Date of presentation

Thursday, June 29th 08:15 to 10:15 (Block B 5 - 6)

Smart City Narrative in Indonesia: Comparing Policy Documents in 4 Cities

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Abstract

This piece aims to investigate the narrative of smart city from Indonesian smart city awardees based on Smart City Index 2015 (Yogyakarta City, Surabaya City, Magelang City, and Madiun City). By comparing these cities' medium-terms development planning documents using narrative policy approach and content analysis as a method, it can be argued that various cities define smart city initiative differently in regards to the explicit definition and smart city themes in their policy document. This result offers comparisons on how these cities engage with smart city initiative. It contributes to the smart city conceptualization discourse in the Indonesia's context.

Keywords: smart city, Indonesia, narrative policy analysis, content analysis

1. Introduction

From its website (www.unfpa.org), The United Nations Population Fund wrote that the world population growth and urbanization level will be continuing significantly in the next decades. More than half of the world's population now lives in urban areas and by 2030, this number is projected to reach 5 billion. Much of urbanization will likely happen in Asia and Africa region. As an emerging economy country, Indonesia is not the exception in joining this trends. The population growth is increasing so rapidly especially in the cities area. Latest data from Indonesian Central Agency on Statistics reported that the population growth rate in the cities is 2.18 % per year. This number is higher than the growth in the village areas, of

which only 0.64% per year. Further, the Indonesian Central Agency on Statistics has predicted that 82,37 % of Indonesian population will live in the cities by 2045.

The urban lifestyle phenomena will not only bring economic consequences but also political, social, environmental, and other exacerbate urban problems. Off course, it requires city governments to improve their performance in tackling complicated urban problems using effective and efficient strategy. Like a smart phone, smart city initiative offers a variety of features and intelligent services to meet the needs of its citizens. The combination of information technology applications and collaboration of local governments-citizens in designing policies and public services becomes the axis of smart city implementation.

As a recent phenomenon, smart city diffusion has grown rapidly from advanced countries to developing ones. Many cities in South East Asia including Indonesia have become keen on 'smart city' recognition and immediately jumped on the bandwagon to apply this concept. Practitioners, politicians, and public managers eagerly used smart cities as a jargon in their day-to-day administration.

Many cities in Indonesia have claimed as smart cities or at least they declared themselves to have a smart city status. Indeed, some cities in Indonesia obtained several awards and recognition related to smart city program. The city of Bandung, West Java, for example, became one of six finalists of the 2015 Smart City Expo. Bandung competes with Buenos Aires (Argentina), Curitiba (Brazil), Dubai (United Arab Emirates), Moscow (Russia), and Peterborough (UK). With the slogan of 'Connected citizen', Bandung City encourages citizens to be actively involved in the management of social, environmental, and political aspects. Not only Bandung, Surabaya is also able to outperform cities in the Asia Pacific

region through the event Future Gov Awards in two categories namely, Data Center and Data Inclusion.

In fact, not a single city in Indonesia has been in the smart city status¹. One of the smart city assessments as a benchmark for smart city developments in Indonesia is called the Indonesia Smart City Indicators or *Indikator Kota Cerdas Indonesia* (IKCI) initiated by Kompas, Bandung Institute of Technology (ITB), and National Gas Company/*Perusahaan Gas Negara* (PGN). This index integrates internal bureaucracy assessment including infrastructure as well as supra-structure and the external community regarding service responses. Thus, it comprehensively measures the performance of smart city performance from either internal aspect or external one. ICKI has 6 categories of assessment using parameters of population, economic, social, and environmental category. Sourced from IKCI assessment, the winners of smart city award in Indonesia only get the average score of 60, whereas the real smart city index should be at the score of 80.

Table 1. The winners of smart city IKCI 2015

Categories	Winners
Population over 1 million people	The city of Surabaya
Population of 200.000 to 1 million people	The city of Yogyakarta
Population up to 200.000	The city of Magelang
Economic	The city of Magelang
Social	The city of Madiun
Environment	The city of Surabaya

¹ This opinion was made by the initiator of Smart City Indonesia Professor Suhono Harso Supangkat in his speech on National seminar titled ‘Collaboration of Regional Government, Universities and Industries to Smart and Sustainable City at the Universitas Muhammadiyah (UM) Magelang (23/09/2016) Accessible at <http://www.koran-sindo.com/news.php?r=6&n=23&date=2016-09-23>

Within national policy scope, the smart city policies listed in the National Medium-Term Development Plan (RPJMN) 2015-2019. The concept of smart city is positioned in the national urban development policy agenda as an umbrella for urban development policy. Policies and strategies are directed to the development of competent and technologically-based smart cities and local cultures by: (a) Developing the economy through city branding that supports national branding; (b) Providing public infrastructure and services based on Information and Communication Technology (ICT); (c) Building innovative, creative and productive social capital and community capacity. Reading above narratives, the concept of smart city program at the national level is still abstract since it has not been elaborating the substance and dimensions of smart city. This fact results an absence of clear policy guidance for cities in Indonesia to apply the concept of smart city. In the practical venues, the model of multi-level governance of regional autonomy which implemented in Indonesia from 1999, allowed local governments to design their development agenda including smart city initiative.

There is no clarity in terms of smart city definition either in the national policy level or local jurisdiction although it is very important to have operational definition. Why definition matters? At least three arguments offered to answer this inquiry. Firstly, the clarity of the concept provides stakeholders a robust understanding about the clarity of government policies and programs, so that it can answer what, who, when, how, and how far the smart city program is implemented. Secondly, it enables set standards which can be used as reference to monitor and evaluate smart city program. Thirdly, in the theoretical perspective, clarity of terminology helps researchers to make policy theorization of smart city conceptions.

In academic discourse, there is also no common understanding and agreement to define what is meant by smart city and how it should be implemented (Gil-Garcia, Pardo, & Nam, 2015), even though the phrase of 'smart city' has been widely used in the urban governance (Alejandro et al., 2014; Chourabi et al., 2011; Nam & Pardo, 2011; Neirotti, De Marco, Cagliano, Mangano, & Scorrano, 2014). As an emerging-multidiscipline concept, the smart city is still on its progress and applied in different nomenclatures and contexts. Some publications tried to conceptualize the notion of smart city such as Chourabi et al., (2011) ; Harrison, C. and Donnelly (2011); Nam & Pardo (2011) rooted in the developed countries setting.

Yet, there is still lack of conceptualization and theorization on Indonesia's smart city. This study will fill the gap of smart city conceptualization in Indonesia context. Thus, this article aims to tackle these following questions. First, how do winners of smart city contest of IKCI 2015 express smart city concepts in their policy documents? Second, what themes of smart city concept frequently emerge in their policy documents?

Magelang city, Jogjakarta city, Surabaya city, and Madiun city are chosen as representative of Indonesia's top achievers in the Indonesia Smart City Indicators 2015. Reading on how they define smart city program will enhance our understanding the way in which these cities conceptualize smart city as the foundational element of urban policy implementation. This study also offers empirical comparisons of smart city policies among the top Indonesian cities with the highest index on national smart city assessment. To do so, this study focused on the analysis of strategic policy dimensions by comparing the contents of policy documents in city development program among four cities using a narrative policy analysis approach. The strategic policy on smart city program becomes very important and influential since it

highly leads the implementation phase (Angelidou, 2014; Dameri & Cocchia, 2013; Renata Paola Dameri, 2013; Paroutis, Bennett, & Heracleous, 2014).

This article starts with the theoretical review on smart city concept and its relation to the public policy as a bench of analysis. Then, the investigation on smart city definition and interpretation on smart city stated in their policy document is conducted. The last section discusses a comparison analysis to understand how these cities engage with smart city program in the effort of urban development.

2. Smart City: The Evolution, Definition, and Dimension

The smart city concept was originated from the word *smart growth* which mainly used on urban planning activities (Harrison & Donnelly, 2011). Then, it widely used IT corporation such as Siemens (2004), CISCO (2005), IBM (2009), Alcatel (2012) in relation to building information system supporting urban infrastructures. They can be telecommunication, transportation, energy and waste management, and other public service deliveries. This smart city concept further developed into an ideal city that uses technology to improve the quality of life and satisfy citizens' needs.

The researchers from various disciplines had begun to study the smart city phenomena either in theoretical aspect or practical venues. The publications on smart city scholarship showed interdisciplinary perspectives of which involved in smart city process (Dameri & Cocchia, 2013). The information and communication technology views smart city as the use of information technology on urban management where information technology companies play an important role in it (Bartenberger & Grubmüller-Régent, 2014). This definition stressed to the way in which cities use the support of information technology in city

development process as well as public service deliveries. Consequently, the information technology companies are highly involved in smart city program.

Other disciplines see with different view to define smart city, for instance, urban and regional planning study, Angelidou (2014) argues that smart cities are urban settlements that seek to utilize strategic information technology landscapes to achieve prosperity, effectiveness and competition levels of cities. In this concept, the smart city stressed on landscape and settlements issues. From the public administration study, smart cities denote to the ability of cities to integrate public sector innovations not always from, although most are from information technology to improve living standards in the context of society, economics, mobility and governance (L. G. Anthopoulos & Reddick, 2016). In this sense, the public-sector innovation is on the lead to improve quality of life. Not least, in line with public administration values, the context of society, efficiency, and governance should be unified in smart city program.

Being aware that smart city studies come from many fields, the unified definition is hard to be achieved. Smart city is a complicated concept (Nam & Pardo, 2011), also ambiguous terminology even in academic literature (Alejandro et al., 2014). The simple way to interpret smart city is chopping the phrase into single word. Smart city contains two words: smart and city. The practical terms of city can be seen the place where people live but more modern than village or town with more complicated problem as well. From the resident activities point of view, the city is not just a place to work but is a livable place. While smart, according to Indonesian Dictionary can be defined as clever, competent, ingenious, resourceful, proficient.

The meaning of a smart city is multi-faceted and have many indicators for measurement (Albino, Berardi, & Dangelico, 2015). In the practical area, smart city can be termed in many jargons such as digital city (Rezende et al., 2014), intelligent city (Komninos, 2006; Mulay, Dhekne, Bapat, Budukh, & Gadgil, 2011), city information (Piro, Cianci, Grieco, Boggia, & Camarda, 2014), ubiquitous city (Anthopoulos & Fitsilis, 2010). The variations occurred are part of different meanings by which cities interpret smart city policies. However, as a conceptual and operational basis, it is necessary to clearly define the working definition of smart city policies. Some definitions are expressed by scientists as follows:

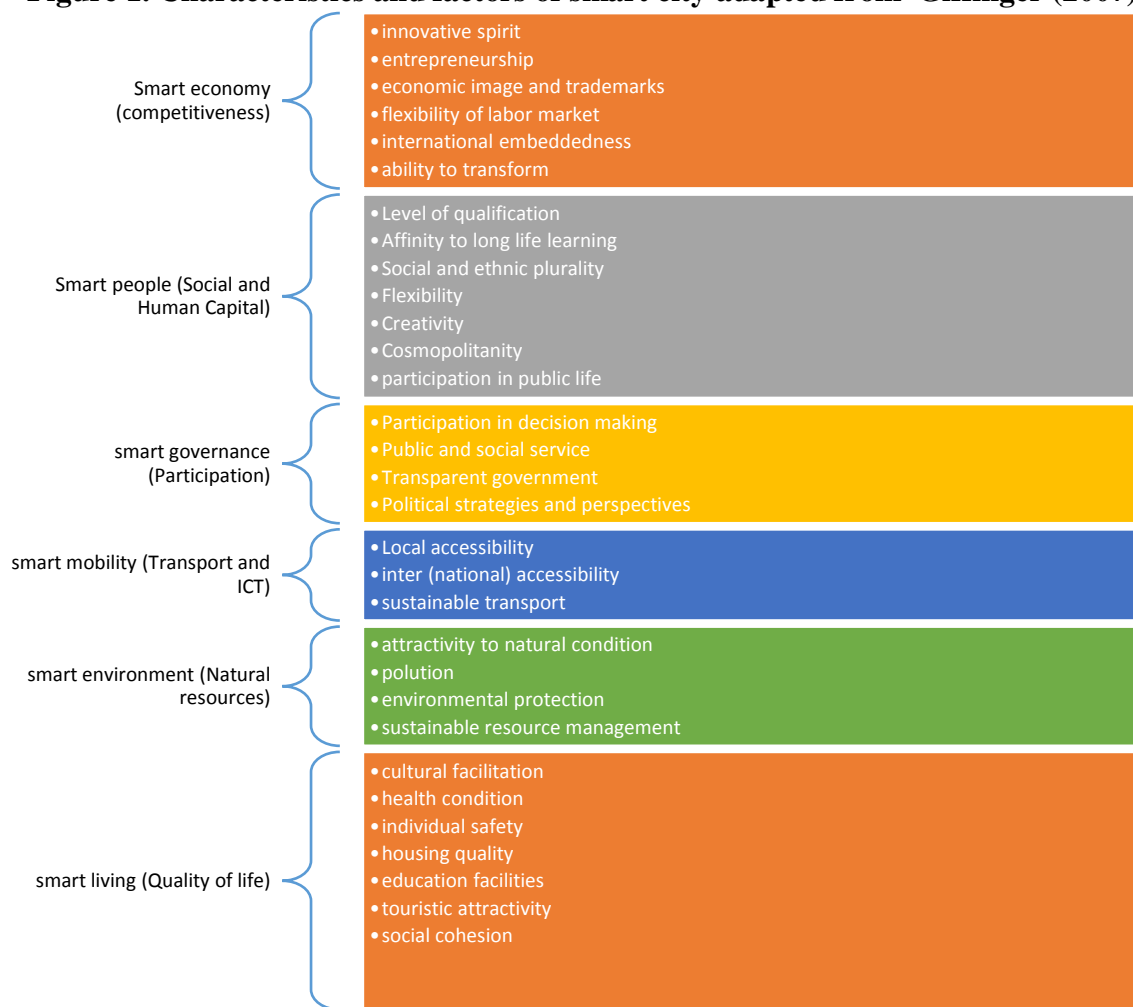
Table 2 Smart City Definitions

Definition	Publications
<i>“investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance.”</i>	Caragliu, Del Bo, & Nijkamp (2011:6)
<i>Collaborative urban systems which include environmental management, infrastructure, resources, services, and social systems.</i>	Harrison, C. and Donnelly (2011)
<i>The use of infrastructure networks to improve socio-economic efficiency and urban development.</i>	Komninos (2006)
<i>Smart city is high performance city in which contributed by participative-awareness inhabitants.</i>	Giffinger & Fertner (2007)
<i>Cities that connect physical infrastructure, information technology, business infrastructure to improve collective intelligence.</i>	(Harrison et al., 2010)

From above various definitions, we can draw some key issues and principles which shape smart city concepts such as the use of information technology, physical infrastructure, social

capital, business world, and the governance aspect to go to a habitable city in an innovative way. In addition, it is very crucial to understand smart city by reviewing its dimensions in which smart city initiatives can be seen in the implementation phase. Giffinger (2007) stated 6 characteristics, 31 factors, and 74 indicators as a hierarchic structure in understanding smart city. The 6 characteristics consist of smart economy, smart people, smart governance, smart mobility, smart environment, and smart living. This model can be visualized below.

Figure 1. Characteristics and factors of smart city adapted from Giffinger (2007)



A little bit different from that, Lombardi, Giordano, Farouh, & Yousef (2012) who modified version of the triple helix model contained three main agencies of knowledge creation: universities, industry, and government excluded smart mobility in their smart city dimension.

Thus, their version designates to 5 dimensions: economy, people, governance, environment, and living and elaborated in 60 indicators. Their framework built on a reference framework for the analysis of knowledge-based innovation systems. This triple helix-based omitted smart mobility as part of the smart dimension. However, in the practical avenue, the smart mobility feature is sometimes posited as a weakness spot on the urban issues. To be more realistic, the Giffinger's model must be forwarded as guiding concept.

3. Smart City and Public Policy

The smart city initiative should not be perceived as technological issue alone, but a complex process of institutional change in the socio-technical governance (Meijer & Rodri, 2016). Some framework to explain smart city have been proposed by scientists such as Chourabi et al. (2011) who offer smart city as integrative framework, Harrison and Donnelly (2011) with their urban system to analyze smart city, or Nam & Pardo (2011) who argue smart cities as multi-dimensional entities consisting of technology, people, and communities.

Of the three models, a multi-dimensional perspective by Nam & Pardo (2011) is likely become the most ideal choice as an analytical framework for understanding smart city policies in research loci. This model is similar to what Meijer & Rodri (2016) called as smart city focus on technology, human resource, and governance. Institutional perspective by Nam & Pardo (2011) is very similar with governance focus from Meijer & Rodri (2016), while human resource is equal to human factor.

The multi-dimensional perspectives of technology, human, and institutional factors have rationally lied in the interconnection and interdependence themes to support smart city policy implementation. In addition, the model was drawn from the practical experience of cities that

are considered successful in implementing the concept of smart city. The principle of integration of these three factors is the synergy of infrastructure and technology services, social learning for infrastructure strengthening, and governance for the improvement of institutional quality and community participation.

In the technological perspective, the main goal is the creation of an environment for information sharing, collaboration, and operating capacity. In addition, smart cities also rely heavily on computer technology as an essential infrastructure and component in the service to citizens (Chourabi et al., 2011: 2291). From the humanity perspective, the term creativity is the key word of smart city system implementation. Bartenberger & Grubmüller-Régent (2014) and Nam & Pardo (2011) put forward the view that social infrastructure is an absolute issue in the smart cities development. The social infrastructure consists of intellectual capital and social capital. More concretely, Bartlett (2005) interprets social infrastructure as a mixture of education / training, culture / art, business / commerce and the hybridization of social, cultural, and economic entrepreneurship. Furthermore, the smart city is a city of learners who seek to increase their competitive value in an urban context (Campbell, 2009). Finally, community factor is a complimentary of public, private, and community collaboration in the implementation of smart city policies. Thus, Institutional capacity is an important issue in supporting smart city governance.

The transformation of smart city initiatives requires interaction between technological components, the social context of urban citizens, and the institutional policy. In other words, the concept of smart city does not live in a vacuum. The political domains of a smart city made up of local leaders, local parliaments, and interest groups will influence the smart city policies. In addition, the technocratic level of local government bureaucracy also contributes

on implementation process (Alejandro et al., 2014; Dameri, 2013). The political domain shall be considered and synchronized with the public demands and policy setting agenda (Klijn & Koppenjan, 2012; Meijer & Rodri, 2016; Wolfe, Jones, & Baumgartner, 2013).

The policy context becomes very important in understanding the smart city initiative (Chourabi et al., 2011). This statement is reinforced by the reality that public information policies included data sharing and use, data security, and data integration are strongly influenced by the government's policy-making process. On the other hand, the policy process also refers to the concept of government innovation as the spearhead of policy makers. Studies conducted by Luna-Reyes, Mellouli, & Bertot, 2013) on digital government success factors is very similar to the concept of smart city (Chourabi et al., 2011) where limited institutional factors such as laws and regulations being manifested on public policy. The study conducted by Angelidou (2014) and Paroutis et al (2014) also stressed the need for smart city initiatives to take account of policy and strategy factors, as well as strategic decision making. For that reason, it is necessary to conduct a study that discusses the policy aspect in the smart city research.

4. Data and Methods

Document Choice and Criteria

The data was taken from legalized policy document which inform the way in which smart city initiative will be implemented. To be sure, city governments have issued and disseminated their policy planning agenda in many ways such as law, policy briefs or memos, press release, social media, and features on their website. However, these variations would generate a confusion and difficulties on comparison analysis. Being aware that this study tries to compare among smart city policy documents, a set of criteria is employed to maintain

objectivity and validity of document compared. Thus, the criteria can be considered on the process of decision making, time-frame aspects, their legality, and funding sources.

Ideally, the narrative policy approach should be analyzed from the regulation that specifically regulating smart city initiative. Unfortunately, there has not been a specific regulation that guides smart city initiative such as grand design or roadmap. For instance, Surabaya City has not legalized its smart city program, but we can find some regulations supporting the realization of smart city (Suhendra, 2017) such as Mayor Regulation Number 5/2013 on Guidelines for Technology Utilization Information and Communication in Organizing Local government or Mayor Regulation Number 28/2013 on Service Licensing and Non-Licensing By Electronics in Surabaya City.

Thus, the choice of policy document falls into Regional Medium Terms Development Planning document /Rencana Pembangunan Jangka Menengah Daerah (RPJMD). RPJMD is the foundational strategic policy document in which city governments design the operational planning development agenda. The decision on picking RPJMD is backed up by four reasons.

Firstly, the RPJMD document is a compulsory document which guides Indonesia local governments to implement local development planning. This means that all the local government with no exception, should have a RPJMD document as an administrative guidance for the next 5 years' polity. The procedure of decision making process of RPJMD document are standardized to all local government in Indonesia. It has some laws and regulation as the legal umbrella included Law number 25/2004 on National Medium-term Development Plan, Law number 17/2007 on National Long-term Development Plan, Law number 9/2015 on Local Government, Government regulation number 8/2008 about The Stages, Procedures for Formulating, Controlling and Evaluating the Implementation of

Regional Development Plans, and The Minister regulation number 54/2010 as the operational level Procedures for Formulating, Controlling and Evaluating the Implementation of Regional Development Plans. Consequently, all the RPJMDs have the same format that ease for comparison analysis.

Secondly, The RPJMD stretched up to 5 years of implementation. It allows local governments to design and implement their strategic policy in the medium-term agenda. Being aware that smart city outcomes cannot be achieved in relatively short-term period, the medium-term development agenda fits for this study to investigate city governments strategic policy.

Thirdly, the RPJMD is legalized as Official Regional Regulation as the manifestation of agreement between regional parliament as legislative body and major/regent/governor as executive. Since the RPJMD is officially legalized, it enforces local governments to implement development agenda in accordance to RPJMD.

Fourthly, the process of RPJMD is funded by local government budget which lead to the autonomy and internal motives. This condition tends to reflect that smart city initiative coming from internal city government, rather than sponsored by external parties such as the non-government organizations or information and communication corporations.

Commonly, RPJMD has 10 chapters. Chapter 1 is about introduction and continued with city/regent's description. Chapter 3 presents regional financial management, while chapter 4 explicates analysis of strategic issues. Chapter 5 and 6 are the core aspect of RPJMD since it declares vision, mission, aims, target and strategies & policy direction respectively. Lastly,

chapter 7,8,9,10 reveal indicative program and budget, regulation frameworks, and performance indicator.

This study used 4 documents as the main policy narrative sources especially focused on chapter 5 and chapter 6 that declares vision, mission, aims, target, strategies and policy direction.

- a. Kota Surabaya Regional Regulation Number 10/2016: Regional Medium Terms Development Plan 2016-2021 for Surabaya City
- b. Kota Yogyakarta Regional Regulation Number 7/2012: Regional Medium Terms Development Plan 2012-2016 for Yogyakarta City
- c. Kota Magelang Regional Regulation Number 1/2016: Regional Medium Terms Development Plan 2016-2021 for Magelang City
- d. Kota Madiun Regional Regulation Number 4/2014: Regional Medium Terms Development Plan 2014-2019 for Madiun City

Analysis of policy narrative

This study followed narrative policy analysis tradition which emphasizes of policy analysis using stories or narrative approach (M. Van Eeten & Roe, 2000; Roe, 1994; Shanahan, Mcbeth, & Hathaway, 2011; M. J. G. van Eeten, 2007; M. J. G. van Eeten, Loucks, & Roe, 2002). As there are many streams of narrative policy analysis such as the narrative analysis of policy, the analysis of policy narrative, the policy analysis of narrative, and the narrative of policy analysis (M. J. G. van Eeten, 2007) that sometime trigger a confusion, this study used the analysis of policy narrative which reconstruct the stories that actor tell about a policy issues, often how issues is framed differently by many actors.

To compare policy texts, this study used content analysis as a method to know how city governments define smart city in their strategic policy document. In the text analysis paradigm, Carter, Ladrech, Little, & Tsagkroni (2017) and Will, Benoit, Slava, & Laver, (2011) argued analytical techniques can be placed into two extremes from qualitative-manual value to quantitative one in the continuum line. To take advantages and dodge some weaknesses from both continuum, this study posited in the middle range which accommodate qualitative-manual and quantitative modes of analysis. In the qualitative-manual analysis, the researcher analyzed RPJMD using semantic analysis and made signposts on the important issues related to the smart city contents. While, quantitative analysis is treated to support qualitative argument. Technically, the researcher used designation analysis (Krippendorff, 2013) to code and count the smart city theme. How many themes that had been coded from policy document is the basic inquiry to investigate the ample themes occurred.

The data management is aided by NVivo 11 as qualitative analysis software to ease the text analysis of the city governments policy documents. Nvivo contain of two core of apparatuses includes Nodes to designate the theme of analysis and source where the set of text is stored and organized. Based on the literature review on smart city characteristics and its dimensions, 7 Nodes were employed to understand how city governments define smart city and interpret this notion on their policy documents. Further, 3 Nodes were used to know the ample themes being used in smart city initiatives.

Table 3 Smart City Definition Text Analysis Framework

No.	Nodes	Description
1	Explicit definition of smart city	The document explicitly presents the smart city definition on its text
2	Smart economy	The document emphasizes smart city as smart economy (and its indicators) and stressed competitiveness as a keyword
3	Smart people	The document emphasizes smart city as smart people (and its indicators) and stressed social and human capital as keywords
4	Smart governance	The document emphasizes smart city as smart governance (and its indicators) and stressed participation as a keyword
5	Smart mobility	The document emphasizes smart city as smart mobility (and its indicators) and stressed transport and ICT as keywords
6	Smart environment	The document emphasizes smart city as smart environment (and its indicators) and stressed natural resources as keywords
7	Smart living	The document emphasizes smart city as smart living (and its indicators) and stressed quality of life as keywords

Table 4 Themes on Smart city initiative

No.	Nodes	Description
1	Technological aspect	The document stated technology as the main aspect of smart city initiative
2	Institutional aspect	The document stated governance as the main aspect of smart city initiative
3	Human aspect	The document stated human factor and social capital of people who live in the city as the main aspect of smart city initiative

5. Findings

Explicit Definition

In the medium terms development plan, only Magelang City explicitly states the notion of a smart city in its policy document. The other three do not mention explicitly the terms of smart city in their policy documents although they also intended to perform ‘smart’ in fulfilling

their urban development agenda. In the Magelang city's RPJMD, Smart city is defined as *"a city that is managed effectively and efficiently to maximize services to its citizens fairly without discrimination with the support of information technology and information technology-based communication connectivity in the business world, public service delivery system, community participation mechanism in conveying aspiration, control, and complaints, and other areas to support regional competitiveness"*. (RPJMD Kota Magelang, V-1).

Further, it also declares the component of smart city in Magelang City included 6 dimensions of smart city

- a. Smart Governance indicated by development of e-governance and community participation in development planning.
- b. Smart Infrastructure indicated by development of IT network, development of IT based management information system
- c. Smart Economy indicated by city branding development, entrepreneurship development, e-commerce development, and creative economy
- d. Smart environment indicated by management of IT-based environment, IT-based natural resource management and utilization of renewable energy source
- e. Smart people indicated by education and development of technically literate human resources and research support, development of socio-cultural character of the community
- f. Smart Living indicated by ease of access to education services, easy access to health services, media role development, and ease of access to security guarantees.

Table 5 Magelang Smart City Definition

<i>a city that is managed effectively and efficiently to maximize services to its citizens fairly without discrimination with the support of information technology and information technology-based communication connectivity in the business world, public service delivery system, community participation mechanism in conveying aspiration, control, and complaints, and other areas supporting regional competitiveness”</i>	Smart Governance	development of e-governance and community participation in development planning.
	Smart Infrastructure	development of IT network, development of IT based management information system
	Smart Economy	city branding , entrepreneurship development, e-commerce development, and creative economy
	Smart Environment	IT-based environment, IT-based natural resource management and utilization of renewable energy source
	Smart People	education and development of technically literate human resources and research support, development of socio-cultural character of the community
	Smart Living	ease of access to education services, easy access to health services, media role development, and ease of access to security guarantees

Interpreting Smart City Conception from the Urban Development Plan

To ease the elucidation of smart city translation in their policy documents, the analysis of their vision, mission, strategies and policy direction as the crux of development policy is firstly presented. The visualization of the smart city as the translation of core policy document can be seen on the appendices. Secondly, the comparative analysis of a whole policy document from 4 cities will follow accordingly.

Yogyakarta City

Yogyakarta City has a vision as the City of Qualified Education, Character and Inclusive, Cultural-Based Tourism, Center of Services, Environmentally-Based and People-Friendly Economy. From this vision, it can be interpreted that Yogyakarta City is willing to be smart people shown by Qualified Education, Character and Inclusive, Cultural-Based Tourism, smart economy reflected by Center of Services and People-Friendly Economy, and smart environment indicated by Environmentally-Based.

However, in the mission statement, Yogyakarta City intends to achieve smart governance and smart economy. It has 4 missions include: achieve good and clean governance, achieve quality public services, achieve community empowerment with Segoro Amarto movement, and achieve strong regional competitiveness. To operationalize the vision and mission, it also has aims to organize quality government (smart governance), to improve quality public services (smart governance), to improve people welfare (smart people), and strengthen regional competitiveness (smart economy) to advance Yogyakarta city.

In Yogyakarta, the urban planning development is directed to the achievement of smart people, and smart economy who live in the smart environment. To accomplish the visioning urban development, it will be supported by the implementation of smart governance and smart economy. While, the operational level of strategies and policies direction included all aspect in smart city included smart economy, smart people, smart governance, smart living, smart mobility, and smart environment.

Surabaya City

Surabaya city has a vision to be a prosperous, character, global competitiveness, and ecological-based city. Prosperous and global competitiveness can be considered as smart economy, character-city as smart people, and ecology-based city is analogue to smart environment.

This vision is materialized in 10 mission statements as follows:

- a. achieve quality community resources (smart people)
- b. empower the community and creating the widest opportunity for all (smart people)
- c. maintain security and public order (smart living)
- d. realize an integrated spatial arrangement and attention to urban capacity (smart living)
- e. strengthen the facilities and infrastructure and the environmentally friendly settlements (smart environment)
- f. strengthen local cultural values in society (smart people)
- g. realize Surabaya as the hub of trade and services national as well as international (smart mobility)
- h. strengthen good governance (smart governance)

- i. strengthen the competitiveness of local economic enterprises, product innovation and services, and the development of creative industries (smart economy)
- j. achieve integrated city infrastructure and utilities (smart living)

As the operational guidance of development planning, the elucidation of strategy and policy direction is also need to be discussed. By reading strategies and policy direction, RPJMD Surabaya city contains of smart economy, smart people, smart governance, smart living, smart mobility, and smart environment.

Magelang City

The Magelang city states its vision as smart and modern service-city based on prosperous and religious society. This vision clearly calls the notion of smartness as a key point in its policy document which can be treated as mainstreaming agenda in the effort of urban development. The interpretation of this vision mainly pinpoints the smart economy to provide city within modern services based on smart people which reflected by religious society. In its vision, there are two notions of smart city dimension. Smart people and smart economy are likely solid points, while other dimensions such as smart governance, smart living, smart mobility, and smart environment are absent.

To achieve its vision, The Magelang City has 5 missions to be done. Firstly, to improve the qualified and professional apparatus by optimizing technology as the basis of clean local government and responsiveness to the community aspirations, able to improve and manage the potential of the region in the context of the effectiveness and efficiency of services to the community supported by community participation to improve the welfare of the community. This mission focused on the direction of smart governance since it relies on the good and clean governance and community participation. Secondly, to develop and maintain urban

facilities as well as basic services of education, health, and trade to be more modern and environmentally friendly. This mission can be attributed to the smart living and smart environment. Thirdly, to increase the equity of urban infrastructures to support economic development and community welfare. This mission is nearly associated to smart living and smart economy. Fourthly, to develop cultural and local art as the foundation of development and tourism of the Magelang city which entitled as smart people perspective. Lastly, to strengthen religious life and tolerance among religious communities through religious activities and improvement of religious facilities as the foundation of civil society which notably going to the fulfillment of smart people.

In addition, the Magelang City broaden the dimensions of smart city initiative in the strategy and policy direction parts which mainly consist of 6 smart city dimensions (smart economy, smart people, smart governance, smart living, smart mobility, and smart environment).

Madiun City

The Madiun city wants to be a better and prosperous city. A better city is defined as solid and harmonic society based on local wisdom and religiosity. While, prosperous means all community members reach social-economic independence. Thus, smart people and smart economy are most suited to be interpreted in its vision. To achieve vision, Madiun City has 4 missions. The first mission is envisioned to realize participative development which accentuates people as center of development. The second mission related to smart governance as it designates to clean and good governance. The other two is nearly directed to smart people and smart economy due to its way to public service and prosperity to the people.

Madiun city operationalizes its vision and mission to strategies and policy direction. Although it does not explicitly state in details, all dimensions of smart city initiative had been represented in Madiun city's strategies and policy direction such as achieving better settlement, health, public transport, industries, and sustainable environment besides quality governance. The comparison of vision, mission, strategies, and policy direction can be presented as follows.

Table 6 Comparison of Smart City Translation

	Yogyakarta City	Surabaya City	Magelang City	Madiun City
<i>Vision</i>	3 dimension (people, economy, environment)	3 dimension (people, economy, environment)	2 dimensions (people, economy)	2 dimensions (people, economy)
<i>Missions and aims</i>	2 dimensions (governance, economy)	6 dimensions (economy, people, governance, living, mobility, and environment)	5 dimensions (economy, people, governance, living, and environment)	3 dimensions (governance, economy, people)
<i>Strategies and Policy Directions</i>	6 dimensions (economy, people, governance, living, mobility, and environment)	6 dimensions (economy, people, governance, living, mobility, and environment)	6 dimensions (economy, people, governance, living, mobility, and environment)	6 dimensions (economy, people, governance, living, mobility, and environment)

Synthesized by Author

From the table, there are various pattern how cities formulate their development plan in the perspective of smart city dimensions. The analysis refers to the hierarchical strategic policy from vision to the policy direction as an operational guiding aspect. Start from the vision as the point where these cities want to achieve. Yogyakarta City and Surabaya are equal which contain 3 smart dimensions. Both want to be smart in the corpus of people, economy, and

environment. The other two, Magelang City and Madiun City are in the same boat, who have 2 dimensions in their vision. They are smart people and smart economy. Unlike, Yogyakarta City and Surabaya City, the environment aspect is absent here.

In the missions and aims section which refer to the core activities to achieve the vision, all cities are in the different states. Yogyakarta City has only 2 dimensions (governance and economy), while Madiun city has 3 dimensions include governance, economy, and people. Surabaya City contains all smart city dimensions: economy, people, governance, living, mobility, and environment. Magelang city states its mission in 5 dimensions of smart city with the absent of smart mobility. The only similarity among them can be seen in the strategies and policy directions as operational façade of strategic planning that smart economy, smart people, smart governance, smart living, smart mobility, and smart environment dimensions emerge. The fact that strategies and policy directions are given more details themes of smart city dimensions is understandable since the more operational level, the more details will it be.

Major Themes

Another central discussion in the policy narrative analysis is ‘what theme are frequently occurred in the policy document’. Here, the themes of smart city are technology, institutional, and human aspect. It was drawn and adapted from Nam & Pardo (2011) and Meijer & Rodri (2016) as guiding concept designated to the smart city core factors. From the Matrix Coding Query analysis, which examined how cities write smart city dimensions in their policy documents, four cities experience similar distribution of themes. All cities relatively share in average about 24.79% in human aspect, 65.94 % on institutional aspect, and 9.31 % on technological aspect. In Yogyakarta City, the core development policy planning contained

23.36 % on human aspect, 74.45 % on institutional aspect, and only 2.19 % on technological aspect. Compared to other 3 cities, Yogyakarta has the highest content on institutional aspect, yet the smallest number on technological aspect. Surabaya city also experiences 20.71 % on human aspect (the smallest among 4 cities) and 61.64 % on the institutional aspect. However, it has the highest content on technological aspect which means that this city emphasizes on technology on its urban development to implement smart city program. Lastly, Madiun City and Magelang City are placed in the moderate position since they are in the middle range of coding measurement in the aspect of institutional and technological aspect. On the human aspect, both are first and second place in the human aspect content respectively. Extended data can be seen in the table below.

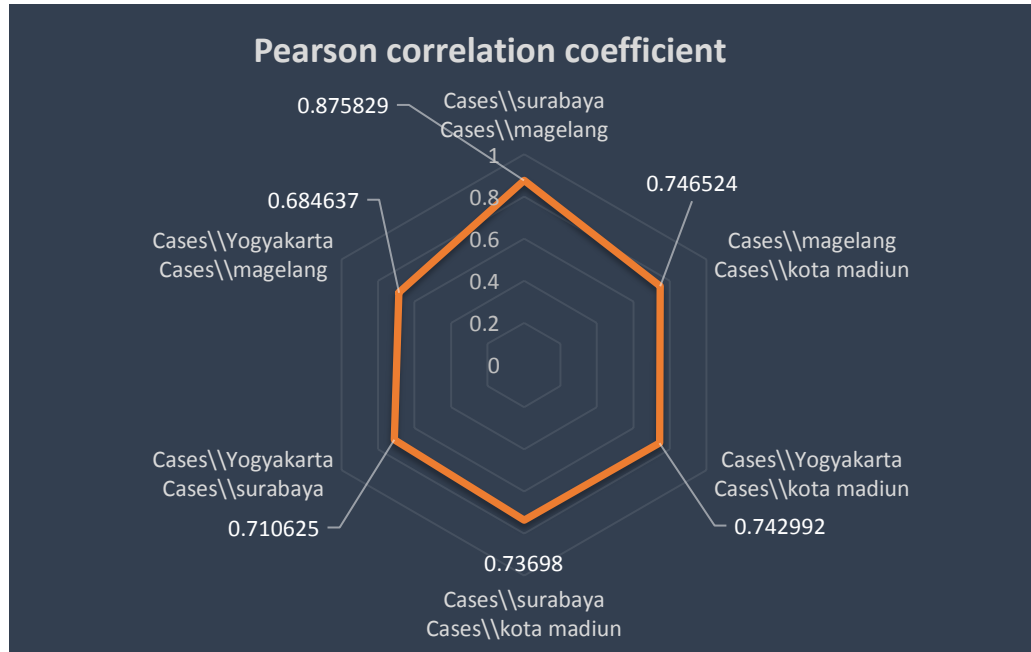
Table 7 Major Themes of Associated to Smart City

	A: human aspect	B: institutional aspect	C: technological aspect	Total
Yogyakarta City	23.36%	74.45%	2.19%	100%
Surabaya City	20.71%	61.64%	17.65%	100%
Magelang City	26.24%	62.45%	11.31%	100%
Madiun City	28.72%	65.2%	6.08%	100%
Average	24.76 %	65.94 %	9.31%	

Source: NVivo 11 Matrix Coding Analysis

In addition, the important issue is about how to measure similarities among cities. An analysis can be executed to investigate the level of similarity of these cities using cluster analysis. The cluster analysis shows that Surabaya city and Magelang city are the most similar based on the words that appear in the text of the nodes/themes. The measurement of Pearson correlation coefficient (-1 = least similar, 1 = most similar) indicates at 0.875. While, Yogyakarta city and Magelang city are the least similar with 0.684. The Pearson correlation can be presented in figure 2.

Figure 2. Cluster Analysis



Cluster Analysis from NVivo 11

6. Conclusion

The motivation of this study is to analyze how recognized-smart cities in Indonesia (Yogyakarta city, Surabaya city, Magelang city, and Madiun city) express the notion of smart city in their policy document. Further, it also aims to investigate the core themes of smart city dimensions which frequently emerged in their urban development plan.

Based on a content analysis of their medium terms development plan/ RPJMD, this study shows that only Magelang city explicitly declares the notion of a smart city in its RPJMD. Magelang smart city is defined as *“a city that is managed effectively and efficiently to maximize services to its citizens fairly without discrimination with the support of information technology and information technology-based communication connectivity in the business world, public service delivery system, community participation mechanism in conveying aspiration, control, and complaints, and other areas to support regional competitiveness”*.

(RPJMD Kota Magelang, V-1). Not only defining the terms, it also expands the multidimensional facet of smart city in 6 scopes. They are smart governance, smart infrastructure, smart economy, smart environment, smart people, smart living.

Although not mentioned explicitly, Yogyakarta, Surabaya, and Madiun city express the notion of smart city in their development planning document. Variations of smart city expression can be found among them, especially in the strategic policy layers. Smart people, smart economy, and smart environment are entrenched in the Yogyakarta city and Surabaya city. While, Magelang city and Madiun city have the vision to attain smart people and smart economy. In their strategies and policy directions, all cities are equal to design the strategy and make operational program guidance which designates to the initiatives of smart economy, smart people, smart governance, smart living, smart mobility, and smart environment.

A simple 'code and count' on the 3 aspects of smart city dimensions showed that All cities relatively share in average about 24.79% in human aspect, 65.94 % on institutional aspect, and 9.31 % on technological aspect. By conducting a matrix coding query analysis, institutional aspect can be found in the highest number on the Yogyakarta development planning document. In another façade, Yogyakarta city has the lowest content on technology, while Surabaya city is ranked number one in the technological aspect. For human aspect, Madiun city is the winner among 4 cities. This finding corroborates to the 2015 Smart City Indicators or *Indikator Kota Cerdas Indonesia* (IKCI) survey that placed Madiun city as the winner of social category.

Policy Implication

The investigation on policy review shows that there is no policy document specifically regulate smart city program in Indonesia local government. In other words, specific regulation which guides smart city initiative such as grand design or roadmap is absent in Indonesia. Consequently, there is no comprehensive strategic policy document to drive city government in integrated smart city program. We can only find partial policy linked to the smart city initiative. For instance, Surabaya City has not legalized its smart city program, yet some regulations supporting the realization of smart city such as Mayor Regulation Number 5/2013 on Guidelines for Technology Utilization Information and Communication in Organizing Local government or Mayor Regulation Number 28/2013 on Service Licensing and Non-Licensing by Electronics in Surabaya City. Yogyakarta city also regulates implementation of e-government as the partial policy to support the effort of smart city implementation by Mayor Regulation Number 15 year 2015 about e-government implementation.

The absent of comprehensive strategic policy on smart city initiative will yield a vague implementation by city administration. In addition, it will soon transform as a *buzzword*, *jargon*, and *media speak* with inconsistent meaning. There is also a potential of vested interest or political benefit which will be counter-productive to the smart city development. Thus, the existence of comprehensive smart city policy is urgently needed in Indonesia local governments as the foundational policy document in implementing smart city initiative in their jurisdiction.

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Appendix: Visualization of Smart City Translation in Strategic Policy Layer

Yogyakarta City

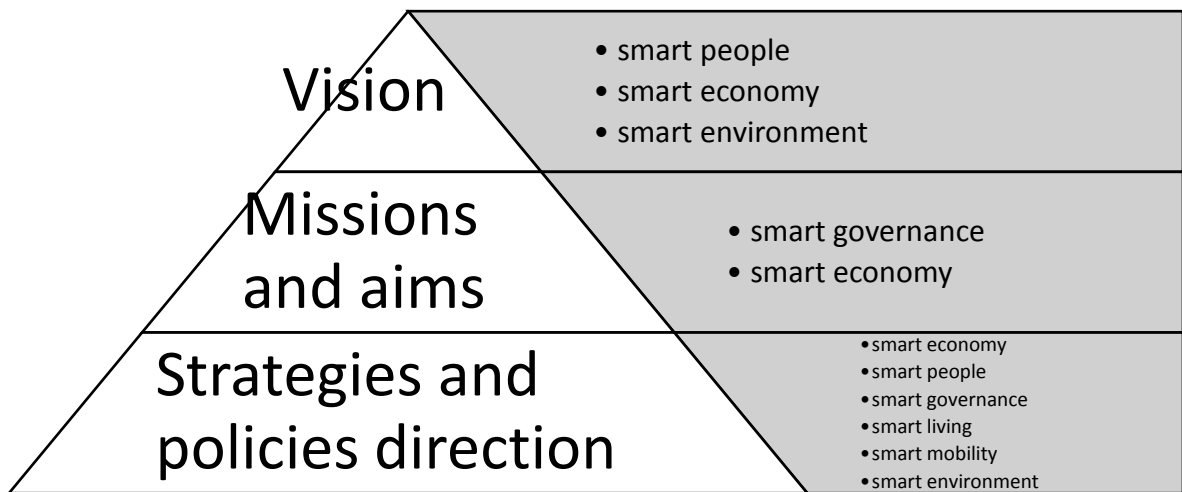
Vision

Qualified Education, Character and Inclusive, Cultural-Based Tourism, Center of Services, Environmentally-Based and Community-Based Economy.

smart people

smart economy

smart environment



Surabaya City

Vision

prosperous, character, global competitiveness, and ecological-based city

smart people

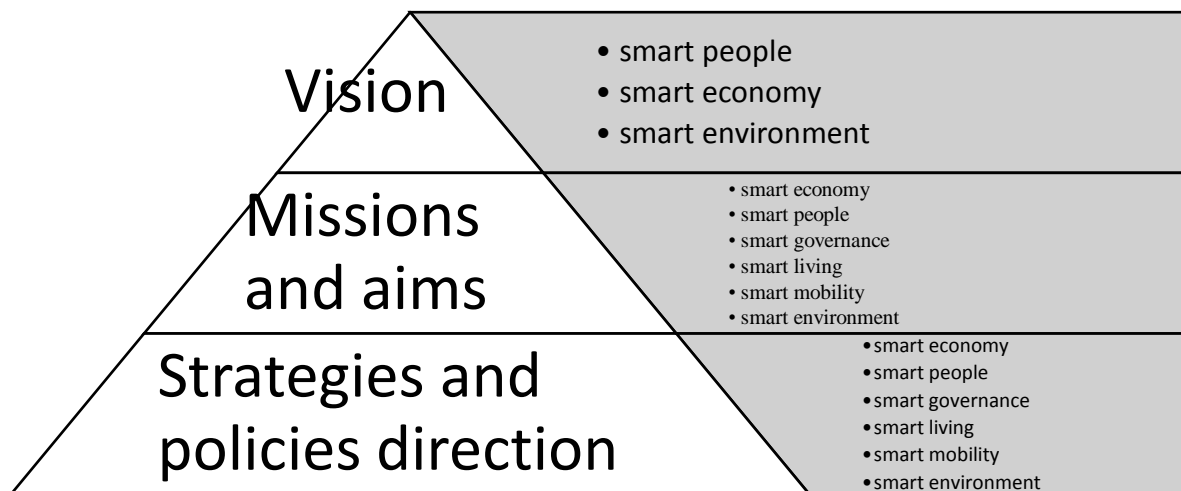
smart economy

smart environment

This vision is materialized in 10 mission statements as follows:

- a. achieve quality community resources (**smart people**)
- b. empower the community and creating the widest opportunity for all (**smart people**)
- c. maintain security and public order (**smart living**)
- d. realize an integrated spatial arrangement and attention to urban capacity (**smart living**)
- e. strengthen the facilities and infrastructure and the environmentally friendly settlements (smart environment)
- f. strengthen local cultural values in society (**smart people**)
- g. realize Surabaya as the hub of trade and services national as well as international (**smart mobility**)
- h. strengthen good governance (**smart governance**)
- i. strengthen the competitiveness of local economic enterprises, product innovation and services, and the development of creative industries (**smart economy**)
- j. achieve integrated city infrastructure and utilities (**smart living**)

As operational guidance of development planning, the elucidation of strategy and policy direction is also need to be discussed. By reading strategies and policy direction, the building logic of RPJMD Kota Surabaya can be visualized below.



Magelang City

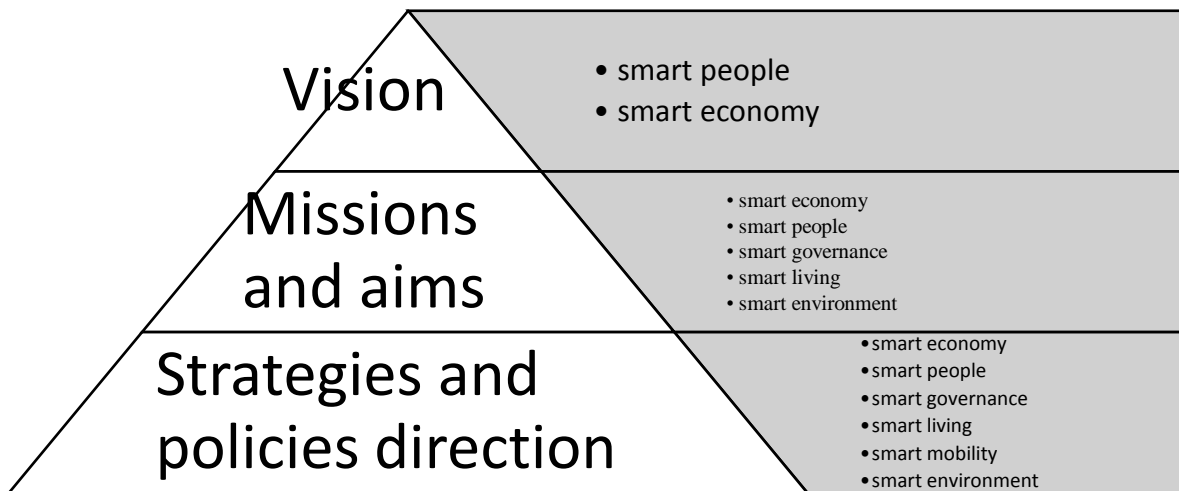
The vision

smart and modern service-city based on prosperous and religious society

smart people

smart economy

In addition, the Magelang City broaden the dimensions of smart city initiative in the strategy and policy direction parts which mainly consist of 6 smart city dimensions. The figure can be visualized below.



Madiun City

The Vision

better and prosperous city

smart people

smart economy

