

Modular-Integration for Smart Governance Development Efficiency in Developing Countries

Adi Hendro Purnomo^{1✉}, Fitriansyah², Ari Sasmoko Adi³, Pebiansyah Hafsari⁴, Yuli Fitrianto⁵

Regional Research and Development Agency (Balitbangda), East Kalimantan Province, Indonesia id

E-mail: adibalitbang@gmail.com

ABSTRACT

The development of smart governance as one of the elements of a smart city requires an approach that is more efficient but easily adaptable to regional characteristics. One method for developing efficient and integrated smart governance is through an integrated modular-customization system. The modular system can not only be used for the development of information system infrastructure, but also for other infrastructure such as regulatory products, funding systems, human resource development and training systems. This study aims to evaluate the level of maturity and barriers to the development of smart governance, as well as to limit the strategy based on modular-integration for smart governance development efficiency in developing countries, Indonesia. The research was conducted in the province of East Kalimantan, Indonesia in the context of developing a smart city to support the nation's capital. A qualitative approach to the analysis of the relevance index, the maturity level of smart governance, potential barriers and wider opportunities for modular-integration development. The research results are as follows. First, the relevance index of the modular-integration system is 0.81 or is included in the relevant category, meaning that the modular-integration system has the potential to be used to support efficient smart governance. The maturity level index is 0.59 or is included in the defined category or the development stage. Second, the development of a modular-integration system in supporting smart governance has a number of potential barriers, namely: (1) inter-regional regulations that have not been integrated, (2) changes in work patterns and even loss of jobs, especially government officials in routine jobs due to service automation, (3) there are many public service problems that are not ready to be electronically based. Such as the problem of mapping and land conflicts, validation and poverty data that is not always updated, and not ready for electronic basis, (4) not all people in urban areas have access to information technology, (5) technical infrastructure problems, data security, data that has not been integrated with data, and human resources. The development of an integrated-modular system, namely there is a general base module that is easily adapted (customized) according to the potential and problems of the city.

Keywords

smart governance;
policy evaluation;
modular-
customization;
integration

1. INTRODUCTION

The global population is expected to grow to between 8.3 billion and 10.4 billion in 2045 [1], [2], Population growth requires the availability of food, water, energy, and other units of public services on an ongoing basis. On the other hand, the availability of natural resources has decreased, while the quality of the environment has decreased. Food demand in several countries tends to decrease significantly due to decreased productivity of agricultural land, water shortages tend to be very acute in many areas, exacerbated by increasing demand and climate change. By 2045, it is projected that 70% of the global population will live in urban areas. Many cities in the world will experience scarcity of food, water and energy sources, massive urbanization. The availability of natural resources is expected to be unable to meet the increasing demand even though technology will increase the efficiency of natural resources [2].

The President of Indonesia in April 2021 revealed the vision of the new State capital in East Kalimantan as a smart and sustainable city [3]. The relocation of the new capital includes taking into account the carrying capacity of the old capital, especially in the future. The application of smart cities is expected to contribute to resource management and various potential resources and economic, social, environmental issues in an efficient and sustainable manner. The policies for developing smart cities in Indonesia are included in the Work Plan. The 2018 government stated that cities in Indonesia must be prepared to implement the concept of a sustainable city. The Ministry [1] rolled out the vision of Sustainable and Competitive Cities 2015-2045 as the direction for the development of urban areas in Indonesia.

The development of smart governance as one of the elements in the development of smart cities in East Kalimantan Province, Indonesia has the potential in the midst of increasingly complex and dynamic environmental changes. The problems in urban areas are increasingly complex which requires solving problems across sectors, across urban-rural areas and collaboration between actors in the internal and external environment of the organization. The problems of urbanization, the need for healthy, clean and natural energy, food, water, oxygen in urban areas require integrated problem solving between sectors, between rural and urban development areas. The problem of food availability in urban areas, for example, is not only related to agriculture (production) and trade, but also nutrition and food security (health), local food security (food security) and urban planning (urban farming). Global pandemics, natural disasters also increase uncertainty.

The development of smart governance provides the potential for not only integrated data, but also integrated policies in governance in public services amidst environmental complexity and uncertainty. The development of smart governance in East Kalimantan Province, Indonesia has a number of opportunities and challenges. The development of smart governance has the opportunity to overcome various city problems so far, not only smart cities but also wise cities [4]. The development of smart cities provides potential in the development of inclusive cities (for all), sustainable management of resources (economic, social, environmental), efficient and sustainable management of water and energy resources, healthy and natural cities, green cities rich in oxygen and low pollutant, increased participation, transparency, low congestion, integrated marketing and improvement of the product value chain. Smart governance-based development provides a broad space for innovation to solve various problems faced and improve the quality of life for humans and local communities.

On the other hand, the development of smart governance in East Kalimantan Province has a number of potential barriers [5]. First, not all people in urban areas have access to information technology. Access to information technology is limited, especially for the poor in urban areas. Second, the development of smart cities that lead to service automation will cause routine jobs to potentially be replaced by automated machines. This will have an impact on changes in employment patterns and even loss of jobs, especially for government officials in routine jobs. Third, there are many problems in public services that are not ready to be electronically based. Such as mapping problems and land conflicts, validation and poverty data that are not always up-to-date, and not ready to be electronically based. Fourth, is the potential for technological errors, technological dependence and data security. Without bureaucratic reform, the level of data security is dubious and very vulnerable to misuse, even being hijacked. [6], [7]

Governance in facing the Industrial Revolution 4.0 era in East Kalimantan Province, among others, is contained in the Information and Communication Technology Master Plan document for the Government of East Kalimantan Province for 2019-2023 [8]. Good governance requires the establishment of a government that is clean, transparent and able to respond effectively to demands for change where the public demands public services that meet the interests of the wider community, are reliable and trustworthy, and are easily accessible interactively. The development of smart governance as one of the pillars in the development of smart cities in East Kalimantan Province, Indonesia requires readiness [9]: regulations, technological infrastructure, institutions, human resources, management and culture. Smart city development requires a gradual and sustainable

strategy. Smart governance development must be in accordance with the character and specific needs of the region, especially in the new state capital in East Kalimantan Province. Development of smart and effective governance to be able to provide maximum benefits, right on target and effective and sustainable.

2. LITERATURE REVIEW

2.1. Smart Governance

Smart Governance is a concept of developing and managing cities by intensively empowering the latest technology (including computer networks, sensors, internet of things, cloud computing, big data, data analytics, space/geographical information integration, etc.) [10]– [13], [7] to integrate human systems with the city's physical systems and digital systems so that they are able to be creative and innovative: feel, hear, capture, understand and respond to the needs of their citizens in a proactive, fast and appropriate manner; monitor, control, communicate, deliver, and improve the quality of public services and other municipal services such as transportation, electricity, environment, security, and emergency services; monitor the condition of the city's critical infrastructure, plan maintenance activities, and improve its security; optimizing the efficient and sustainable utilization of city resources; improve operational efficiency and municipal services; increase comfort for living (livable); improve the quality of life/welfare of its citizens (quality of life); maintaining equality for all citizens (equity); ensure the development and sustainability of the city in the future and meet the needs of current and future generations (sustainable) both economically, socially and environmentally; increase city competitiveness (competitiveness); increasing the city's resilience in anticipating and recovering quickly from the effects of disasters, crime, and various other potential risks (resilience). [6]

Cities can be analogous to the human body or other living organisms consisting of interacting systems [10], [6]. Each system can stand alone and can be interconnected with other systems in a larger system. Some of these systems include government systems, economic systems, food supply systems, energy systems, social systems, health systems and information systems. Meanwhile, city information systems include sensors, computer networks, computing and control, data centers, and others. A smart city is a city that has the ability to respond quickly to environmental problems, has the ability to capture environmental opportunities, has the ability to learn quickly and manage resources effectively and efficiently. [10]

The capacity of a smart city is supported by a reliable data and information management system [11]. Information systems in smart cities consist of input, process and output components. The input component is like the five human senses (eyes, ears, skin, nose, tongue) to recognize, smell, hear, see, touch, and feel something [10]. Smart city input components are useful for recognizing and capturing the environment, such as: visuals, sounds, air temperature, light. Smart city information systems include connecting with personal devices, cameras, smartphones, medical devices, websites, and other similar data acquisition systems, including social networks as human sensor networks. Smart cities have a number of sensors that provide data and information that can be used for other system settings. The smart city concept is not only data integration and information management, but also decision making. The smart building system consists of hardware and software components. Both components, both hardware and software components, can be improved in quality or adjusted to needs by adding, reducing, deleting, replacing or combining.

The development of digital technology has created a new urban environment that evolves from managing data, information and knowledge to maximizing decision making [10], [6], [11], [12]. Smart City can be defined as a city that has the ability to proactively identify and collect data from various city components (both physical and social components) to then process and respond quickly and precisely. Smart City is essentially Cyber-Physical-Social systems within the scope of the city, namely a system that integrates the city's physical systems, social systems, and digital systems through cyber media (internet). [12], [13], [7].

2.2. Modular-Integration

Based on the Resource Based View (RBT) Dynamic Theory approach [14], each region consists of a set of resources. Some resource elements are general in nature which are homogeneous between several regions. Some resource elements in the region are unique and valuable core resources. These core resource elements are important resources for regional competitiveness,

Based on Systems Theory, cities consist of sub-systems and elements that are interconnected with one another. Modularity standardizes the way appropriate elements communicate with each other and work together in a way that can be clearly understood and codified. Standardization and codification make elements or sub-systems and their relationships with other elements or sub-systems clearly understood. Integrated systems are sub-systems or elements that easily communicate and work together in an integrated manner. Modular theory, as explained by Simon, provides a basis for product or element standardization as well as the relationship between units or elements. The idea of modularity is to build a complex system from smaller subsystems – modules – that are specialized for a set of operations and interact with each other via interfaces, but which can be removed or recombined to obtain new configurations without losing system functionality (Gärtner & Schön, 2016).

The idea of modularity is to build a complex system from smaller subsystems – modules – that are specialized for a set of operations and interact with each other via interfaces, but which can be removed or recombined to obtain new configurations without losing system functionality [15]. Modular systems divide the system into smaller parts called modules, which can be created, modified, replaced, or exchanged independently with other modules or between different systems [16]. More generally, the basic units of analysis in modularity theory are decisions, components or tasks, and their dependencies. Other benefits of modular systems include the deployment or even reduction of risk across system modules, increased efficiency by stimulating competition among modules, and simplified management of different systems. complex [15], [16]. The potential for managing through a modular system is not only for information systems, but also for product development [15], strategic management [17]–[21] and regulation [13].

3. METHOD

This research is a type of policy evaluation research that uses a qualitative approach. A qualitative approach is used to evaluate the relevance and maturity level of the integrated modular system in supporting smart governance. A qualitative approach for in-depth analysis of the results of a quantitative study and for identifying opportunities and constraints.

The study uses primary data and secondary data. Primary data were obtained from questionnaires and interviews with parties related to the development of smart cities in the provincial and district/city governments throughout East Kalimantan, consisting of: (1) Head of the Office of Communication and Information in the provincial government and district/city governments throughout East Kalimantan, (2) Secretaries and staff of the Ministry of Communication and Informatics in the provincial and district/city governments throughout East Kalimantan, (3) leaders and staff of the Regional Research and Development Agency (Balitbangda) in the provincial government and regency/municipality governments in East Kalimantan. The Head of Service and Staff of the Office of Communication and Informatics (Kominfo) are taken as the parties who best understand the development of smart cities in the engineering aspect. The Head of Service and Balitbangda Staff as part of the East Kalimantan Bappeda were taken to represent parties who understand non-engineering aspects.

In addition to questionnaires, interviews were conducted to explore and collect information on existing problems, wants and needs as well as alternative solutions to problems related to the development of smart cities in East Kalimantan Province. The purpose of the interview is to explore specific issues related to the topic to be discussed in order to avoid the wrong interpretation of the researcher or consultant on the problem caused by the subjectivity of the researcher. Interviews are not conducted for the purpose of generating direct problem solving or reaching consensus, unless the

topic discussed is problem solving, then this interview is useful for identifying various strategies and problem solving options. In order to get as much information as possible, open-ended questions were used in the interview technique which allowed participants to give answers with explanations. The facilitator functions as a moderator who acts as a guide, listener, observer and analyzes data inductively.

Secondary data obtained through document observation is a source of data obtained by researchers indirectly through intermediary media and recorded by other parties. The documents in this study include documents that contain data, information, policies related to smart city development. Data validation was obtained through source and method triangulation techniques. Basic data obtained through document observation.

The method of analysis and discussion is carried out with a quantitative and qualitative approach. Quantitative analysis through Gap Analysis (Gap Analysis). Gap analysis on the level of importance and maturity level of implementing a modular-integrated system to support smart governance. The analysis was carried out based on questionnaire data. In the analysis stage so that data can be interpreted, the analysis of this research data is divided into 3 parts, namely analysis of the current maturity level (as-is), analysis of the expected maturity level (to-be), and analysis of the gap level (gap analysis). In this study, the maturity level analysis technique used in data governance is as follows:

Table 1.

Relevancy Index Scale and Maturity Level		
Maturity	Relevance/ Maturity Level	Information
0.84 – 1.00	5	Optimizing
0.67 – 0.83	4	Quantitatively Managed
0.51 – 0.66	3	defined
0.34 – 0.50	2	managed
0.17 – 0.33	1	Initial
0.00 – 0.16	0	Non-Existent

The information life cycle questionnaire in data governance is weighted from 0 to 13.89 . Furthermore, a recapitulation of answers is carried out which describes the percentage of each answer to the questionnaire. Then calculate the value of each maturity level by dividing the number of answers by the number of respondents, the formula is written as follows:

Maturity Index = $\frac{\text{Total Value}}{\text{Number of Respondents}}$

The above formula applies to subdomain criteria whose maturity level can be calculated, such as archive data and unstructured content, data classification and determining service levels, setting policies for processing test data, setting electronic document policies only. The Maturity Index obtained is then made into a scale which is mapped again to the maturity level to determine the level of maturity. The process of analyzing the maturity level of the expected state is the same as the process for calculating the maturity value of the current state (As-Is). The process is as follows: the information life cycle questionnaire in data governance is given a weight from 0 to 13 .89 . After finding the results of the average current maturity level (As-Is) and expected maturity level (To-Be), the next step is gap analysis. This gap analysis is carried out to identify what activities need to be carried out by the authorities so that the actual situation regarding the current maturity level (As-Is) can reach the expected level (To-Be).

4. RESULTS AND DISCUSSION

4.1. Smart city and Smart Governance policies

The plan to relocate the State capital is contained in Law no. 3 of 2022 concerning the State Capital [28]. The policy describes the vision of a new state capital that is: sustainable, a symbol of national identity, a driving force for the economy in the future. Based on Law no. 3 of 2022 the IKN smart city concept consists of 3 main elements: (1) Vision and results aligned with the IKN overall strategic framework, (2) Smart areas and strategies that outline the main digital opportunities for IKN, (3) Smart initiatives for development city. Smart initiatives that must be prioritized by IKN include: access and mobility, Environment and Climate; Security and Safety; Public Sector; Urban System; and Livability and Dynamics.

The application of the smart city concept can actually be implemented at various levels of government, starting from smart nations, smart provinces, smart cities, to smart villages. Law No. 23 of 2014 concerning Regional Government states that the Provincial Government acts as the representative of the Central government in the regions. For Smart Province, the smart element must be attached to the responsibilities of the provincial government, namely, among other things, being the representative of the central government in the regions, and coordinating various affairs at the district/city level. The Provincial Government also has a strategic role in government affairs whose benefits or negative impacts cross districts/cities as well as Government affairs where the use of resources is more efficient if carried out by the Province.

Each region in Indonesia is unique. Each region has valuable resources that are not owned by other regions which are a source of regional competitive advantage. On the other hand, each region also has valuable resources, but these resources are general in nature and belong to other regions. Each region is trying to develop a smart city in accordance with the potential and problems of its own city. The development of a smart city is an expensive thing, requiring a large investment from regulatory development, infrastructure and structure development, so that it requires an approach in the development of a smart city that is more efficient but still suitable for regional characteristics.

One of the methods for developing an efficient and integrated smart city but still adaptable to regional characteristics is through a modular-customization system. The modular system in smart city development is that there are the same basic modules and can be used by each region because some potentials and problems for each region have the same characteristics (such as: green action, inclusive cities, economic and social empowerment). However, in the end each region has different characteristics through adaptation strategies through customization (adding, subtracting, combining, upgrading, breaking, ending, etc.). Some modules are common applications and can be used for all regions depending on adoption needs. Some of these modules are: e-musrenbag, basic food price monitoring system, smart water supply system, traffic control system, parking information system, poor validation system, river management control automation system, e-planning, ebudgeting, e-monev. This module can be developed at the provincial and even national level, because each region has the same problem, but the scale is different. Some modules cannot be implemented directly but through an adaptation process such as a change in service scale, such as: a river management automation system or a flood control system because an area has no potential for flooding problems. Each basic module can be developed through a customization strategy by adding, subtracting or combining the basic modules.

The modular system can not only be used for technological infrastructure development, but also for other infrastructure such as: smart city regulatory products, smart city funding systems, human resource development and training systems. The modular system can be used for structure development (HR, management and financing), infrastructure (physical, ICT, social) and superstructure (Perda and other regulations, institutions, and their implementation). Modularity offers benefits such as reduced costs (customization can be limited to a portion of the system, versus fixing the whole system), interoperability, shorter learning times, flexibility in design, augmentations or

upgrades that are not generationally constrained (adding new solutions simply by including new modules) , and exceptions.

4.2. Gap Analysis

The analysis of a modular-integrated system in supporting smart governance is used to evaluate policies from the aspects of relevance and level of implementation (practice). Judging from the level of technological relevance, all components of a modular-integrated system in supporting smart governance are considered very important by respondents. The average score of the relevance index of the modular-integrated system in supporting smart governance is 0.81 is in the interval 0.833 – 1, included in the very relevant category. Based on the results of FGDs and interviews with stakeholders, it can be seen that a modular-integrated system has the potential to be used to support the development of efficient and sustainable smart governance in the aspects of governance, economy, mobility, environment, life. The results of the evaluation of the level of technological maturity, obtained maturity level is 0.58 or is in the interval 5.01 – 6.66 or is included in the defined category, meaning that the modular-integrated system in supporting smart governance is still in the development stage and needs to be continuously developed.

The results of the questionnaire show that ind Smart Governance has an index of 0.68 which is at maturity level 3 or is in the defined category. This means that Smart Governance has been well managed in the organization. The Regional Government of East Kalimantan Province at this stage has well-documented IT processes which are then communicated through training. Organizations are also aware of the need for governance processes so that there are rules indicating for organizations to routinely carry out IT governance

Currently, administrative services to the community (such as: identity cards, business licenses , birth certificates, land certificates, taxation, building permits, etc.) are still carried out conventionally. At this time, both in East Kalimantan and many areas in Indonesia in general, public services are carried out using a conventional approach. Residents to obtain population administration records, migration, permits, land certification, or other public services are done manually. Residents generally come to local officials, then queue to go to the sub-district office, sub-district office, related offices in the district to obtain public services. Residents need a lot of time, effort, and transportation costs to obtain public services. Meanwhile, the government needs physical space infrastructure facilities, waiting rooms, equipment and administrative staff to provide services. The resources needed to acquire and provide services can actually be allocated to other activities more efficiently and effectively.

Table 2.

Summary of Evaluation Results of the Relevance and Maturity Level of a modular-integrated system in supporting smart governance

Dimensions and Indicators	Relevance	Maturity index
Smart Governance	0.94	0.68
Access to public services	0.95	0.61
Integrated policy	0.95	0.68
Inclusive city development (for all): The government does not yet have a system for monitoring the provision of basic food needs for the community (basic necessities, clean water, etc.)	0.93	0.70
Democratic process: It is also difficult for the community to be involved in decision-making, development planning, control, monitoring and evaluation of development processes	0.92	0.69
Modular-Integrated System	0.81	0.58
Regulatory product	0.83	0.58
Funding system	0.81	0.58
Human resource development and training system	0.78	0.57

Dimensions and Indicators	Relevance	Maturity index
Democratic process	0.83	0.59

Source: results of interviews with stakeholders in the development of smart cities in East Kalimantan

Data between government agencies are also often not integrated. Each agency often has its own data. For example, poverty data in the social service, the central statistics agency, the village ministry, and the health office are often out of sync. Although in the last few years there has been an improvement. Data is also often not updated. If there is one agency that updates data, sometimes it doesn't automatically update data in other instances. In addition to poverty data, data also occurs on land, civil registration, taxation and other agencies. As in the case of buying and selling land that has been transferred to someone else's name. The ownership status has been registered with the land office, but other agencies, such as the tax office, still have the land ownership number registered in the name of the previous owner. This often hinders social services, decision making and planning of development programs.

The government does not yet have a system for monitoring the provision of staple goods for the community (basic necessities, clean water, etc.), such as: a basic food price monitoring system and a smart water supply system. The government also does not yet have a system for monitoring the provision of basic service needs for the community (electricity, telephone, internet and others). It is also difficult for the community to be involved in decision making, development planning, control, monitoring and evaluation of development processes (score=0.78, not optimal category). There is already transparency, accountability as in development programs, use of the budget but not easily accessible in the decision-making process, deliberations for development planning, criticism, suggestions, community input, brainstorming involving the wider community is difficult to do with conventional methods.

4.3. Barriers

Superstructure, namely governance, which includes regional policies or regulations, institutions, and procedures for implementing development. Provincial Authority: the provincial government (Pemprov) plays a role in inter-regional collaboration and integration in overcoming urban problems. Law No. 23 of 2014 Pemprov bridging various barriers and cooperation between regions. The provincial government is not busy with its own programs, but can facilitate smart city programs from regencies or cities in its territory or other provinces. Lack of inter-city cooperation and coordination, operational network, unclear IT management, policy consistency, lack of reliance on government regulations, private-public participation, lack of developing a common model of information system and the unavailability of a roadmap for smart province development.

In terms of communication supporting infrastructure, there has been a positive trend in 2017-2020. The number of telecommunications towers in East Kalimantan has increased from year to year, namely from 909 towers in 2017, continuing to increase every year to reach 1,118 towers in 2020. This increase is in line with one of the goals of the SDGs, namely the ninth goal, related to the development of resilient infrastructure and encourage innovation. Specifically, this increase is a positive indication for achieving the SDGs targets, namely significantly increasing access to information and communication technology, and seeking to provide universal and affordable internet access in less developed countries by 2010. Number of BTS telecommunication towers in East Kalimantan Province in 2019 it has reached more than a thousand towers, 1,009 units to be exact. This number has increased by exactly 100 towers when compared to 2017 which was only 909 units.

Infrastructure includes physical infrastructure, digital infrastructure, and social infrastructure for the public interest. The current condition of the information and communication technology infrastructure of the Provincial Government of East Kalimantan. The implementation of ICT within the Provincial Government of East Kalimantan is generally quite good, as evidenced by the ICT Pura award that has been won. Most government agencies have implemented information and communication

technology to facilitate the main tasks and functions of each agency. Based on the survey, it is known that there have been 74 applications that have been developed within the Provincial Government.

East Kalimantan. Several agencies have also developed local computer networks equipped with internet facilities. However, there are still some problems that need to be overcome so that ICT implementation can be maximized. Some of the problems that were identified during the survey conducted by the ICT Development Master Plan preparation team included: internet service speed which was limited in several agencies, data security factors were not given enough attention, between agencies were not connected in an intranet network, data had not been integrated, the number of resources information and communication technology people who are still limited, and limited information and communication technology infrastructure facilities and infrastructure. Technological barriers: lack of knowledge of planners on technology, lack of access to technology, privacy and security, system failure problems, network integration and convergence, data availability and scalability, not all people in urban areas have access to information technology. There are many public service problems that are not ready to be electronically based. Such as mapping problems and land conflicts, validation and poverty data that are not always updated, and are not ready to be electronically based.

Structure evaluation consists of human resources, management, and financing), Economic barriers: high cost of infrastructure development, lack of competitiveness, costs of training and skills development, global economic volatility, high operational and maintenance costs, Social barriers: assessed from human resources namely changes in work patterns and even loss of jobs, especially government officials in routine jobs due to service automation. lack of involvement from citizens, low level of awareness from the public to convey and evaluate ideas for innovation in smart city design, public lack of understanding of smart city ideas, and their implications for quality of life, Environmental barriers: less ecological behavior, population growth problems, lack of sustainability considerations, resource degradation. Legal and ethical barriers: cultural issues, data security issues.

5. Conclusion

The modular-integrated system has the potential to be used to support the development of smart governance as one of the elements of an efficient and sustainable smart city. The technology relevance index is 0.78 or is included in the relevant category, meaning that the benefits are greater than the potential risks. The maturity level index is 0.61 or is included in the defined category or development stage. The development of a modular-integrated system in the development of smart governance has a number of potential barriers. In terms of superstructure conditions, the provincial government does not yet have a roadmap for the development of smart governance. Each region seeks to develop smart governance according to the potential and problems of its own city. Judging from the condition of the infrastructure, several barriers include: (1) not all people in urban areas have access to information technology, (2) limited internet service speed in several government agencies, (3) data security factors, (4) the number of human resources limited information technology, and (5) limited information technology infrastructure facilities and infrastructure. In terms of structural conditions: (1) changes in employment patterns and even loss of jobs, especially for government officials in routine work due to service automation, (2) Third, there are many problems in public services that are not ready to be electronically based. Such as mapping problems and land conflicts, validation and poverty data that are not always updated, and are not ready to be electronically based. The development of smart governance as one of the elements of a smart city is expensive, requiring large investments from regulatory development, infrastructure and structure development, thus requiring a more efficient approach to development but still appropriate to regional characteristics. One method for developing efficient and integrated smart governance is through a modular-customization system. The modular system can not only be used for the development of technological infrastructure, but also for other infrastructure such as regulatory products, funding systems, human resource development and training systems.

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