SMART CITY POLICY EVALUATION MODEL: A CASE STUDY IN MADIUN CITY

Maidi Maidi1
Bambang Supriyono2
Sofjan Aripin3
Akadun Akadun4

ABSTRACT

Purpose: Madiun City's development intertwines with evolving community needs and technology. Evaluating its smart city policy is vital. Policy functions include assessment, value clarification, and method application. This research aims to create a robust model by studying formulation, implementation, impact, and actors of smart city policies, addressing pandemic challenges for sustainable progress. It strives to construct an ideal evaluation model, enriching Madiun's journey toward a tech-empowered urban landscape.

Method: This study evaluates the policy using the Smart City Policy Evaluation Model, finding success in improving citizens' quality of life, economic growth, and environmental sustainability. Challenges faced by urban administrators include funding, stakeholder coordination, and effective communication strategies for citizen engagement.

Results and conclusions: This study comprehensively evaluates Madiun City's Smart City Policy, highlighting successes and challenges. It offers insights for policymakers and planners navigating their own cities' smart policies.

Implications: Through a thorough evaluation of Madiun City's Smart City Policy, this study offers valuable insights for policymakers and planners navigating the complexities of implementing smart policies in their respective cities.

Originality/value: The originality and value of this journal lies in the holistic approach to evaluating smart city policies, the development of a comprehensive evaluation model, the emphasis on pandemic challenges, and the practical implications for policy makers. This journal not only considers technological aspects, but also social, economic, and environmental aspects in evaluating the success of smart city policies.

Keywords: Smart City, Urban Planning, Evaluation Model, Public Policy.

MODELO DE AVALIAÇÃO DE POLÍTICAS DE CIDADE INTELIGENTE: UM ESTUDO DE CASO NA CIDADE DE MADIUN

RESUMO

Objetivo: O desenvolvimento da cidade de Madiun se entrelaça com a evolução das necessidades e da tecnologia da comunidade. Avaliar a sua política de cidade inteligente é vital. As funções políticas incluem avaliação, esclarecimento de valores e aplicação de métodos. Esta pesquisa visa criar um modelo robusto, estudando a formulação, implementação, impacto e atores de políticas de cidades inteligentes, abordando os desafios da

1 Faculty of Law, Social, and Political Sciences, Universitas Terbuka, South Tangerang, 15418, Indonesia. E-mail: maidimaidi.ut@gmail.com
2 Faculty of Administration Sciences, Universitas Brawijaya, Malang, 65145, Indonesia. E-mail: bambangsupriyono@ub.ac.id
3 Faculty of Law, Social, and Political Sciences, Universitas Terbuka, South Tangerang, 15418, Indonesia. E-mail: sofja@ecampus.ut.ac.id
4 Department of Administration Sciences, Universitas Sebelas April, Sumedang, 45621, Indonesia. E-mail: akadun@unsap.ac.id
pandemia para o progresso sustentável. Ele se esforça para construir um modelo de avaliação ideal, enriquecendo a jornada de Madiun em direção a uma paisagem urbana capacitada pela tecnologia.

**Método:** Este estudo avalia a política usando o Modelo de Avaliação de Políticas de Cidades Inteligentes, obtendo sucesso na melhoria da qualidade de vida dos cidadãos, no crescimento econômico e na sustentabilidade ambiental. Os desafios enfrentados pelos administradores urbanos incluem financiamento, coordenação das partes interessadas e estratégias de comunicação eficazes para o envolvimento dos cidadãos.

**Resultados e conclusões:** Este estudo avalia de forma abrangente a Política de Cidade Inteligente da cidade de Madiun, destacando sucessos e desafios. Ele oferece insights para formuladores de políticas e planejadores que navegam nas políticas inteligentes de suas próprias cidades.

**Implicações:** Através de uma avaliação minuciosa da Política de Cidade Inteligente da cidade de Madiun, este estudo oferece informações valiosas para formuladores de políticas e planejadores que navegam pelas complexidades da implementação de políticas inteligentes em suas respectivas cidades.

**Originalidade/valor:** A originalidade e o valor desta revista residem na abordagem holística para avaliar políticas de cidades inteligentes, no desenvolvimento de um modelo de avaliação abrangente, no ênfase nos desafios da pandemia e nas implicações práticas para os decisores políticos. Esta revista não considera apenas aspectos tecnológicos, mas também aspectos sociais, econômicos e ambientais na avaliação do sucesso das políticas de cidades inteligentes.

**Palavras-chave:** Cidade Inteligente, Planejamento Urbano, Modelo de Avaliação, Políticas Públicas.

**MODELO DE EVALUACIÓN DE POLÍTICAS DE CIUDAD INTELIGENTE: UN ESTUDIO DE CASO EN LA CIUDAD DE MADIUN**

**RESUMEN**

**Propósito:** El desarrollo de la ciudad de Madiun se entrelaza con la evolución de las necesidades y la tecnología de la comunidad. Evaluar su política de ciudad inteligente es vital. Las funciones de política incluyen evaluación, aclaración de valores y aplicación de métodos. Esta investigación tiene como objetivo crear un modelo sólido mediante el estudio de la formulación, implementación, impacto y actores de las políticas de ciudades inteligentes, abordando los desafíos pandémicos para el progreso sostenible. Se esfuerza por construir un modelo de evaluación ideal, enriqueciendo el viaje de Madiun hacia un paisaje urbano potenciado por la tecnología.

**Método:** Este estudio evalúa la política utilizando el Modelo de Evaluación de Políticas de Ciudades Inteligentes, encontrando éxito en la mejora de la calidad de vida de los ciudadanos, el crecimiento económico y la sostenibilidad ambiental. Los desafíos que enfrentan los administradores urbanos incluyen financiamento, coordinación de partes interesadas y estrategias de comunicación efectivas para la participación ciudadana.

**Resultados y conclusiones:** Este estudio evalúa exhaustivamente la Política de Ciudad Inteligente de Madiun City, destacando los éxitos y los desafíos. Ofrece información para formuladores de políticas y planificadores que navegan por las políticas inteligentes de sus propias ciudades.

**Implicaciones:** A través de una evaluación exhaustiva de la Política de Ciudad Inteligente de la ciudad de Madiun, este estudio ofrece información valiosa para los formuladores de políticas y planificadores que navegan por las complejidades de implementar políticas inteligentes en sus respectivas ciudades.

**Originalidad/valor:** La originalidad y el valor de esta revista radican en el enfoque holístico para evaluar las políticas de ciudades inteligentes, el desarrollo de un modelo de evaluación integral, el énfasis en los desafíos de la pandemia y las implicaciones prácticas para los responsables de la formulación de políticas. Esta revista no sólo considera aspectos tecnológicos, sino también aspectos sociales, económicos y ambientales al evaluar el éxito de las políticas de ciudades inteligentes.

**Palabras clave:** Ciudad Inteligente, Planificación Urbana, Modelo de Evaluación, Política Pública.

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1 INTRODUCTION

The development carried out in the City of Madiun is inseparable from the problems and developments in community needs as well as technological advances, especially information technology. As a government administrator in urban areas, the City of Madiun has the main task of providing quality, fast, effective and efficient public services as well as being able to guarantee the safety of citizens, and provide a quality life to its citizens. The Madiun City Government continues to strive to provide services by following technological developments, especially in establishing Madiun City as a smart city or smart city. The smart city concept is dynamic and focuses on innovation, solutions and optimal utilization of human resources for all work units and government agencies as well as technological resources (Aghimien et al., 2020; Lam & Yang, 2020). Ideas, innovation, creativity to make the City of Madiun a better one is trying to be realized and implemented.

The smart city policy in the City of Madiun is normatively based on the Regulation of the Mayor of Madiun Number 32 of 2020 concerning the Madiun City Smart City Master Plan 2019-2024. In this regulation it is stated that there are two objectives of preparing the smart city master plan, which are: (1) realizing strategic planning in the context of smart city utilization that is comprehensive, integrated and coordinated which dynamically and realistically takes into account and links aspects of institutional management, legal and legislation, software, human resources, data communication networks, information systems and others; and (2) improving the quality of services, integration, synchronization in the planning, implementation and control of smart cities and the implementation of optimal, effective and efficient use of resources (Alizadeh et al., 2019; Karlsson, 2021). While the benefits of preparing a Smart City Master Plan are as follows: (1) realizing the utilization of a Smart City that is comprehensive, integrated and coordinated dynamically and realistically; (2) realizing the implementation and development of smart cities that are more systematic, directed, sustainable in order to support the tasks and functions of the Regional Government in increasing the effectiveness of public services as well as services between government agencies (Barnes et al., 2021; Cheng et al., 2021; Michalec et al., 2019).

However, this normative basis will be much stronger if it is supported by a legal umbrella at the national and regional (provincial) levels. The legal basis for the national (central) and regional (provincial) level of smart city policies so far does not yet exist. The synchronization of smart city programs at the central, provincial and district/city levels is also still not strong. As stated by Echebarria et al. (2021) that the quality of a policy depends on the
process of making the laws and regulations that underlie it. If the legal basis is prepared with thorough public consultation, then the socialization process and implementation of a policy will also run effectively and well (Echebarria et al., 2021).

Smart city is a city development concept by applying technology in an innovative, effective and efficient way by connecting physical, economic and social infrastructure in an area so as to improve services and create a better quality of life (El-Sherif, 2021). Smart city is the development of urban areas that have integrated information and communication technology in daily governance with the aim of realizing efficiency, improving public services, and increasing the comfort and welfare of its citizens. According to Hartama et al. (2017) the smart city concept is the integration of information directly with urban communities (Hartama et al., 2017). Moreover, supported by many supporting facilities and assisted by cellular operators will accelerate the achievement of a city towards a real smart city. Not only smart technological sophistication, but how to promote social culture will go hand in hand with the progress of the city itself. Meanwhile (Lee et al., 2014) emphasized that the concept of a smart city is not just technological euphoria but how to be able to present creative and innovative solutions to all city problems, such as floods, traffic jams, air pollution, managing slums, managing waste and waste, building houses and smart green building and so on (Lee et al., 2014).

As a policy and program, of course the smart city policy in Madiun City requires evaluation. As stated by Macke et al. (2018) that the functions of public policy are as follows: (1) evaluation provides valid and reliable information regarding policy performance; (2) evaluation contributes to the clarification and criticism of the values that underlie the selection of goals and targets; (3) evaluation contributes to the application of other policy analysis methods (Macke et al., 2018). Meanwhile, another research reported that the evaluation process will be influenced by the extent to which the policy deviates from previous policies and is influenced by a number of necessary organizational changes (Rulinawaty et al., 2023). The organization's work program also confirms its position that change, control and compliance are important concepts in evaluation procedures (Lee et al., 2014). Theoretically, the research on the smart city policy evaluation model: the Madiun City case has legitimacy for policy research because it is viewed from the process, namely policy evaluation, the content, namely smart city, and the context of Madiun City. This research has a theoretical problem. This is due to the process perspective, namely there are differences in concepts and practices in policy evaluation. At least opinions are divided into two, namely on the one hand research that policy evaluation can only evaluate the impact of policies. The rationale of this group of experts is that a policy
has a goal, policy evaluation basically measures the achievement of goals after the policy is implemented. Therefore, policy evaluation is to measure the effectiveness of the policy or the impact of the policy. This opinion also has implications for the deadline for a policy (Lee et al., 2014; Macke et al. 2018; A. O. Michalec et al., 2019).

On the other hand, there are experts and researchers who argue that policy evaluation research can target the focus and or process of policy development (including policy formulation), policy implementation, and policy impact (Lee et al., 2014; A. O. Michalec et al., 2019; Molnar, 2021). E-government policies including smart city policies are sustainable policies that have no end point. E-government or smart city policies are classified as policies that are expected to result in continuous quality improvement, therefore there is no end point (Vij et al., 2021). For reasons like this, policy evaluation on the impact of the policy and only at the last stage of the policy's life is not appropriate. Holistic policy evaluation starting from program development, policy implementation, policy impact (even evaluating policy implementing actors) is appropriate for evaluating smart city policies (Camero & Alba, 2019; Echebarria et al., 2021; Staletić et al., 2020). In addition, there are also differences in concepts and terminology in the process of policy formulation and policy making. Likewise, the steps in the process of formulating or making policies. For example, Caragliu et al. (2011) states that policy formulation activities include identifying and understanding problems, setting agendas, formulating public policy problems, and designing public policies (Caragliu et al., 2011). According to Molnar (2021), the policy formulation process includes setting policy agendas, formulating policy issues, designing alternative policies, and legitimizing policies (Molnar, 2021).

In policy implementation there are various complementary theories and or even differences. Van Meter and Van Horn in 1975 developed a model of the policy implementation process. Daniel Mazminian and Paul A. Sabatier in 1981 identified the variables that affect the achievement of formal goals throughout the implementation process. Policy Implementation Model George C. Edward III (1990) which analyzes variables or critical factors in the implementation of public policies. Four variables or critical factors in the implementation of public policy. In the evaluation of public policies there are also various differences and problems (Caragliu et al., 2011; Fuchs, 2021; Molnar, 2021). Ahmad et al. (2022) describes six steps in policy evaluation, namely: identifying the objectives of the program to be evaluated; analysis of the problem; description and standardization of activities; measurement of the level of changes that occur; determine whether the observed changes are the result of the activity or
due to other causes; several indicators to determine the existence of an impact (Ahmad et al., 2022).

As a public policy, the Madiun smart city program also still needs improvement in matters related to its evaluation. Standards, criteria and indicators for the success of smart cities in Madiun City are still not able to capture a comprehensive picture of the success of a policy. In addition, the evaluation methods and instruments also require a review process to make them valid and reliable. Especially in the Covid 19 pandemic situation, there are many variables that require adjustments both in terms of methods and instruments to make them more effective and efficient. In terms of program sustainability, it also requires the implementation of a good evaluation and sustainability. Departing from these problems, the authors raised this study. The focus of this research is the evaluation of smart city policies in Madiun City which will be seen from the process of formulating smart city policies, the process of implementing smart city policies in the form of programs and activities, the impact of smart city policies especially for improving services and community welfare, as well as the role of actors influencing success. smart city policy implementation in Madiun City, and an ideal model for evaluating smart city policies.

2 METHODOLOGY

2.1 RESEARCH PARADIGM AND APPROACHING TECHNIQUE

This study uses a post-positivism paradigm. The reason is because in the activity after finding theoretical answers and theoretical answers that will be used as operationalization of the concept. The operationalization of this concept is the basis for making various kinds of smart city research instruments. In addition, post-positivism is used because in practice this research uses more than one data collection technique. This study uses a qualitative approach with an analytic descriptive model because it is relevant to the problems and research objectives which are evaluative in nature (Nilssen, 2019). The analytical descriptive research model can also provide policy recommendations from comprehensive research results (Yu & Zhang, 2019).
2.2 RESEARCH DESIGN

As a typical phenomenon, evaluating the implementation of smart city policies by the Madiun City Government, the researchers used a case study research design. According to Ardito et al. (2019), case study is empirical research that investigates contemporary phenomena in a real/contextual context; when the boundaries between the case and the context are blurred, using multiple sources of evidence, and based on time (Ardito et al. 2019). They provided characteristics for case studies, namely:

a. Identify “cases” for a study;

b. A system bound by time and place;

c. Using various sources of information in data collection to provide a detailed and in-depth description of the response to an event;

d. Researchers focus on describing the context or setting for a case.

In the research context, the case study design is an appropriate research strategy because:

a. The case studied is the evaluation of the implementation of smart city policies in Madiun City;

b. Analysis of the evaluation of smart city implementation in Madiun City.

The executor is the evaluator of the City Government of Madiun.

2.3 LOCATION AND RESPONDENTS

The research location is Madiun City which is operationally the Madiun City Government which is implementing smart city policies and programs. The resource person is a policy evaluation expert and smart city expert. Informants are people who know smart city data (Richter et al., 2015; Yigitcanlar et al., 2018). The informants in this study are:

a. Mayor of Madiun;

b. Chairman of the Madiun City Parliament;

c. Secretary of the City of Madiun;

d. Head of the Madiun City Communication and Information Service;

e. Head of Madiun City Planner Bureau;

f. Head of Education and Culture Office of Madiun City;

g. Entrepreneur;

h. Journalist;

i. Community Figures
2.4 DATA COLLECTION

Data collection techniques in this study used four techniques, namely participatory observation, in-depth interviews, and documentation techniques. The main instrument for this research was the researcher themselves, while the supporting instruments for research were cameras, tape recorders, interview and observation formats, and sufficient writing instruments.

Operationally the steps of data collection in this study were carried out as follows:

2.4.1 Interview

Interviews to collect data on the process of formulating or making policies, implementation processes, policy impacts, actors in implementing smart city policies in Madiun City and finding empirical and ideal models for evaluating smart city policies.

2.4.2 Participatory Observation

Observations in this study are to obtain real data in the field related to the implementation of smart city policies in Madiun City. Observation techniques are very important to obtain a precise and accurate picture through recording data obtained through recording devices that have been prepared. Participatory observation was carried out because researchers are actors who are directly involved in the process of formulating, implementing, and evaluating smart city policies in Madiun City.

2.4.3 Documentation

In this study documents are documents related to decisions, important letters/circulars, organizational structures, data boards, work programs, agendas, activity schedules, books or notes (notes), as well as photos and videos related to the implementation of smart city policies in Madiun City.
2.4.4 Focus Group Discussion (FGD)

FGD to validate data that has been collected regarding the evaluation of smart city policies with several key informants and experts in public administration, public policy, smart cities.

2.5 DATA PROCESSING

The process of analysis in qualitative research is basically carried out inductively and interactively from each data unit, together with the process of carrying out data collection, with a cyclical process (De Guimarães et al., 2020; Shorfuzzaman et al., 2021). The process of analyzing qualitative research is carried out in the field together with the data collection process, before the researcher completes the field study. Lam & Ma (2019) stated that there are two main models in carrying out analysis in qualitative research, namely (1) the flow model of analysis, and (2) the interactive model of analysis. In this study the selected analysis technique is an interactive analysis technique (Lam & Ma, 2019). The data processing procedure will use the N-Vivo application.

2.6 DATA ANALYSIS

The data analysis method in this study uses triangulation. Triangulation is quantitative cross-validation. It assesses the sufficiency of the data according to the convergence of multiple data sources or multiple data collection procedures. Furthermore, triangulation can be done by source triangulation, technical triangulation, time triangulation, negative case analysis, using reference materials, and conducting member checks (Biswas, 2019). In this study, researchers used source triangulation, technical triangulation, and member checks. By triangulating sources and member checking, researchers will collect data from several predetermined and selected informants so that the information and data provided does not change and ends with a conclusion on questions that refer to certain indicators (Zhao et al., 2021). This triangulation of data sources at the same time the researcher carried out a member check, that is, every question posed to the informant would be asked again to several predetermined and selected informants.
3 RESULTS AND DISCUSSION

Smart city as a study of public administration, can be seen from various perspectives. Bureaucratic reform has at least institutional dimensions, management, human resources and public services. The development of information and communication technology (ICT) has an impact on the management that gave birth to digital government. Likewise, the development of ICT also affects public services so as to give birth to e-services (e-government in the public domain) (Aghimien et al., 2020; Cheng et al., 2021; Ishida, 2015). However, decentralization and autonomy policies apparently encourage the use of ICT through innovation. The development of ICT, Bureaucratic Reform, and policies on decentralization and regional autonomy lead to smart city policies. The description of the above statements can be depicted in Figure 1.

Figure 1
Relationships between ICT development, bureaucracy reformation, regional autonomy in Smart City perspective

Source: the Authors
3.1 SMART CITY POLICY PLANNING

In systems philosophy, public policy studies consist of policy inputs, policy implementation processes, and outputs, outcomes and policy impacts. From the point of view of this system, policies are policy inputs. Madiun City's smart city policy in the form of Madiun Mayor Regulation Number 32 of 2020 concerning the Madiun City Smart City Master Plan for 2019-2020 is policy input. The Policy Process itself consists of policy formulation, policy implementation, and policy evaluation (Li et al., 2022). Therefore, an evaluation of the smart city policy formulation for the City of Madiun is very strategic for determining a model for evaluating smart city policies in Indonesia. The results of the evaluation of the Madiun City smart city policy formulation can be summarized in Table 1.

Table 1
Summary of Evaluation of Smart City Policy Formulation in Madiun City

<table>
<thead>
<tr>
<th>No</th>
<th>Aspect</th>
<th>Finding</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setting the Policy Agenda</td>
<td>Determining the Smart City Policy Agenda in Madiun City involves stakeholders and shareholders of Madiun City, especially regional apparatus organizations (OPD) which are responsible for the success of several smart for shareholders.</td>
<td>The involvement of shareholders and stakeholders in setting the smart city policy agenda indicates a democratic approach</td>
</tr>
<tr>
<td>2</td>
<td>Formulating Policy Issues</td>
<td>Collective awareness from both state officials, shareholders, and stakeholders (community, private, provincial and central government) of the many urban problems in Madiun City.</td>
<td>Collective awareness is the initial capital for policy effectiveness.</td>
</tr>
<tr>
<td>3</td>
<td>Designing Policy Alternatives</td>
<td>The smart city policy was chosen by the government and the people of Madiun City to deal with Madiun's urban problems.</td>
<td>One of the most important reasons for smart city policies to address urban problems is cost-benefit.</td>
</tr>
<tr>
<td>4</td>
<td>Policy legitimation</td>
<td>Legitimacy of smart city policies in Madiun City in the form of Madiun Mayor Regulation Number 32 of 2020 concerning the Madiun City Smart City Master Plan 2019-2024</td>
<td>Although the smart city policy is legitimized in the form of a mayoral regulation, the ability to communicate and the integrity of the leadership (especially the Mayor) is able to gain support from the regional parliament and the community, role models and performance management become leverage for the support of state officers for smart city policies, technological innovation and service orientation become triggers for the achievement of smart city goals.</td>
</tr>
</tbody>
</table>

Source: the Authors
The formulation of policy problems is an activity to build collective awareness about the existence of problems that are jointly faced by state officials, state employees, and Madiun City stakeholders, both social issues, governance, development, and public services. The more parties that set the agenda and formulate policy issues the more democratic it is. Evaluation of the formulation of smart city policy issues is related to whether the determination and formulation of smart city policy issues is democratic or not. This means that in establishing a smart city policy it involves all parties, both shareholders and stakeholders in a region. More than that, whether the formulation of smart city policy issues is the collective awareness of every public official and civil servant, private sector, and the people of the area (Ivars-Baidal et al., 2023).

Determining policy alternatives to existing problems is also an important step in policy formulation. The more parties involved in determining alternative policies to solve policy problems, the more democratic it will be (Kędra et al., 2023). However, far more important in determining policy alternatives is the analysis of the implementation of the policy, especially on the basis of consideration of the availability of funds to implement the policy (Aditya et al., 2023; Chen & Dagestani, 2023). Evaluation of smart city policies related to the determination of alternative smart city policies needs to analyze whether the policies taken provide funds to finance the implementation of smart city policies and whether smart city policies provide real benefits to the community and regions.

Evaluation of smart city policies is related to the legitimacy of smart city policies whether the legal basis for the policy is to gain support from all shareholders and stakeholders as well as sustainable smart city policies. Requirements for the legitimacy of smart city policies so that they are sustainable and have the support of all parties. First, the smart city policy is an integral part of the programs of the Regional Medium Term Development Plan (or even the Regional Long Term Development Plan). Second, the ability of regional leaders to communicate with stakeholders to support smart city policies. Third, the integrity of regional leaders to advance the region and improve the welfare of the local community. Fourth, the ability of regional leaders to encourage OPD and state officer performance in the form of role figures. Indicators and parameters of the smart city policy formulation evaluation model are described in Figure 2.
3.2 SMART CITY POLICY IMPLEMENTATION

Policy implementation is basically a way for policies to achieve their goals. The policy implementation process is basically an activity carried out by policy implementers in accordance with the provisions of laws and regulations and these activities are related to efforts to transform or statements of policy objectives are set into programs, activities and work that are more concrete (Cai et al., 2023). Activities in the implementation of these policies can be in the form of outreach; allocate and distribute and utilize resources; encourage and mobilize the implementing human resources to carry out the jobs according to the specified policy. In the implementation of smart city policies in the City of Madiun, based on the results of research and analysis of the theory of policy implementation put forward by Edward III that policy implementation is a process for achieving goals and objectives, using real and systematic actions from communication, resources, implementing behavior, and bureaucratic structure. The results of the evaluation of the implementation of the Madiun City smart city policy can be summarized in Table 2.
### Table 2

**Summary of Smart City Policy Implementation Evaluation in Madiun City**

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Finding</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Smart City Policy Communications</td>
<td>Socialization of smart city policies is carried out with more means through meetings and meetings with both shareholders and stakeholders. Implementing the Smart City Policy together with consultants disseminate information to shareholders to departments and directly with the division of their respective tasks. Each agency socializes smart city policies to partners as well as smart city policy targets.</td>
<td>Smart city policy communication is carried out before policies are enacted when the smart city policy formulation is carried out democratically. When the smart city has become a policy, socialization is carried out by the Mayor in coordination meetings which contain directions and instructions, especially the division of tasks with OPD and state officers. The mayor's continuous communication with local parliament and community members. Communication and negotiations with the private sector, interest groups, and higher government.</td>
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<tr>
<td>2.</td>
<td>Smart City Policy Resources</td>
<td>Adequate quantity and quality of human resources Executing operators are adequate, while the adequacy of the quantity and quality of human resources programmers is inadequate. Procurement of facilities and infrastructure is ongoing and utilizes existing facilities and infrastructure. Applications used by OPD can come from ministries and made by Ministry of Information. Sources of funds for the implementation of smart city policies are collaborative, funds from the center (both for funding smart city programs and other decentralized programs for funding OPD programs, government funds.</td>
<td>At the beginning of the smart city policy, the sufficient quantity and quality of implementing human resources, facilities and infrastructure, funds were not sufficient, but the fulfillment of these resources was gradual and planned according to the financial capabilities of the Madiun City government.</td>
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<td>3.</td>
<td>Behavior of Smart City Policy Executors</td>
<td>Executives support the smart city policy, even though at first there was distrust on the part of some state officers. However, there is a division of tasks for each OPD to carry out the smart city dimension, so it is a shared responsibility in implementing smart city policies in the dimensions that are the responsibility, especially supported by e-performance</td>
<td>Smart City Policy Developers consist of the Smart City Council and Smart City Policy Executors supporting smart policies in Madiun City because the Smart City Council are actors who have an interest in the success of smart city policies, while OPD and STATE EMPLOYEE support is due to a mix of example, integrity, instructive and mankind (e-performance).</td>
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<td>4.</td>
<td>Smart City Policy Bureaucratic Structure</td>
<td>The bureaucratic structure in the implementation of smart city policies in Madiun City is in the form of an adhocracy in the form of a Smart City Development Team where the leading sector is the Communications and Informatics Service, while other OPDs carry out smart city tasks both smart governance, smart economy, smart people, smart</td>
<td>The Smart City Policy Implementation Structure consists of the Smart City Council and the Smart City Implementation Team. The Smart City Council as the steering board has the main</td>
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Evaluation of the implementation of smart city policies cannot be separated from the results of research on the implementation of smart city policies in Madiun City, especially the evaluation of smart city policies related to indicators and parameters for the successful implementation of smart city policies in Madiun City. Policy communication is very important in policy implementation because if implementers, stakeholders, and the public get effective information about smart city policies, it is hoped that they will support the implementation of smart city policies. Evaluation of smart city policy communication is related to the extent to which the leader's success in informing policy objectives, policy benefits, work mechanisms, implementing structures and their duties to shareholders, stakeholders, and policy targets (society) in a democratic manner according to those regulated by policy. The parameters evaluated are (1) the executor understands the purpose, benefits, work mechanism, executor structure and main duties; (2) stakeholders understand the goals and benefits of smart city policies; (3) the community understands the purpose and benefits of a smart city (Wu, 2022).

Resources, both human resources, facilities, infrastructure, money (funds), and authority are crucial variables for the sustainability of a policy implementation. Adequate human resources both in quantity and quality become ammunition in carrying out policies to achieve goals. Likewise, facilities such as computers, laptops, programs, CCTV will facilitate policy implementers in achieving smart city policy objectives. Infrastructure such as buildings where human resources carry out smart policies is very essential in achieving the goals of smart city policies (Guo & Zhong, 2022). Money or funds are materials so that the policy machine can be implemented. Finally, authority becomes a resource that triggers executors in carrying out activities and work. Evaluation of smart city policy resources is related to the extent to which the ability of leaders or systems to provide resources (both human resources, facilities,
infrastructure, funds, authority) to implementers of smart city policies so that implementers can carry out activities and work to achieve smart city goals by working mechanism that has been determined by laws and regulations. Parameters for evaluating resources in implementing smart city policies are: (1) adequacy of human resources both in terms of quality and quantity; (2) adequacy of facilities both in terms of quality and quantity; (3) infrastructure adequacy both in terms of quality and quantity; (4) sufficient funds; and (5) adequacy of authority for executors.

Implementer behavior is a variable that successfully implements policies to achieve policy objectives. Edward III classifies the behavior of policy implementers into three, namely the behavior of implementers who support the policy, the behavior of implementers who reject the policy, and the behavior of implementers who are indifferent or indifferent to the policy. From the results of the smart city policy evaluation as shown in Table 3, the behavior of smart city policy implementers in Madiun City is very supportive. Evaluation of the behavior of executors in implementing smart city policies is related to the ability of leaders or systems in stages to gain support from each shareholder and smart city policy stakeholders or the ability of leaders or systems to create conditions for implementers to support and implement policies. The parameters are: (1) integrity and exemplary leadership qualities, (2) direct communication, (3) negotiations, (4) professionalism; (5) customer orientation; (6) executing and enforcing manakin and e-performance.

**Table 3**

**Indicators and Parameters of Smart City Policy Implementation Evaluation Model**

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Indicators</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Communication</td>
<td>The success of the leader informs policy objectives, policy benefits, work mechanisms, implementing structures and their duties to shareholders, stakeholders, and policy objectives (society) in a democratic manner in accordance with those regulated by policy.</td>
<td>1) The executor understands the purpose, benefits, work mechanism, implementing structure and duties.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Stakeholders understand the goals and benefits of smart city policies.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) The community understands the purpose and benefits of a smart city.</td>
</tr>
<tr>
<td>2.</td>
<td>Resources</td>
<td>The ability of leaders or systems to provide resources (both human resources, facilities, infrastructure, funds, authority) to implementing smart city policies so that implementers can carry out activities and work to achieve smart city goals with work mechanisms determined by laws and regulations.</td>
<td>1) Adequacy of human resources both in terms of quality and quantity;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Adequacy of facilities both in terms of quality and quantity;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Adequacy of infrastructure both in terms of quality and quantity;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4) Adequacy of funds; and Adequacy of authority for executors.</td>
</tr>
<tr>
<td>3.</td>
<td>Executor behavior</td>
<td>The ability of leaders or systems in stages to gain support from each shareholder and smart city policy stakeholders or the ability of leaders or stakeholders to create conditions for implementers to support and implement policies.</td>
<td>1) Integrity and exemplary leadership, professionalism</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Direct communication,</td>
</tr>
</tbody>
</table>
systems to create conditions for executors to support and implement policies.

3) Negotiation,
4) Customer orientation
5) ICT-based Execute and enforce mankind and e-performance.

1) There are policy implementers with clear main tasks and functions,
2) There are standard procedures for implementing smart city policies, and,
3) Executor effectiveness in carrying out smart city policies according to their duties and responsibilities.

Source: the Authors

Bureaucratic structure is a critical variable in the success of policy implementation in achieving smart city policy objectives. According to Edward III, at least the structure of the bureaucracy concerns two things, namely the existence of an implementing team that has clear main tasks and functions and the existence of a standard operating procedure (SOP) in carrying out policies. These two important prerequisites, it turns out, are contained in the implementation of smart city policies in Madiun City after evaluation. Madiun smart city policy implementers consist of the Madiun City Smart City Council and the Madiun City Smart City Implementation Team. The two smart city implementing teams have carried out their respective duties and functions based on the SOP. Evaluation of the bureaucratic structure in the implementation of smart city policies is related to the extent to which the leader or system ensures that the executor can carry out their main tasks and functions according to what is regulated in the policy. The parameters are: (1) the existence of policy implementers with clear main tasks and functions, (2) the existence of SOPs in implementing smart city policies (top down and bottom up), and (3) the effectiveness of implementers in carrying out smart city policies according to their duties and functions.

3.3 SMART CITY POLICY IMPACTS

Before establishing and legitimizing a policy, of course, policy makers first conduct a policy analysis. One of these policies analysis is the impact of a policy if a policy is implemented. The impact of a policy can be seen from the achievement of goals, achievement of benefits, and performance as specified in the policy. The results of the impact evaluation of the Madiun City smart city policy are shown in Table 4.
Table 4

Summary of Smart City Policy Impact Evaluation in Madiun City

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Indicators</th>
<th>Parameters</th>
</tr>
</thead>
</table>
| 1.  | Achievement of Smart City Goals | The achievement of smart city policy objectives is the same as the achievement of regional long-term development plans, namely the human development index (HDI), regional gross income, and equity development reports (LPE), besides that it can also be seen from regional government performance indicators such as the index of Electronic-Based Government Systems (SPBE), Smart City, and Electronic Systems. Government Agencies Performance Accountability (SAKIP). From these indicators, the goal of a smart city has been achieved. | Year 2022  
HDI = 82.01  
Gini Index = 0.398  
Open Unemployment Rate = 6.39  
Poverty Rate = 4.76  
Economic growth = 5.52  
Inflation = 5.7  
Performance Index  
Smart City Index  
SPBE Index  
Indicators of achievement of objectives have reached the target, although the SPBE index has dropped to second place. Facilitating state employees work, performance-based management, certainty of a career system, and certainty of a remuneration system. There are public service standards, public accessibility to quality public services and a multiplayer effect.  
HDI, LPE, GRDP, Poverty Rate, Open Unemployment Rate, Inflation, SPBE Index, Performance Index, SAKIP, Smart City Index. |
| 2.  | Achievement of Smart City Benefits | State employees benefit from the existence of a smart city policy because management and development are well implemented with e-performance, as well as the people of Madiun can receive benefits from the smart city policy due to the various impacts of infrastructure development and making applications in running government, development and services. to society. |  
Facilitating state employees work, performance-based management, certainty of a career system, and certainty of a remuneration system. There are public service standards, public accessibility to quality public services and a multiplayer effect. |
| 3.  | Smart City performance | Achievement of performance targets for smart policy macro indicators as well as governance indicators. |  
There are public service standards, public accessibility to quality public services and a multiplayer effect. |
| 4.  | Smart Governance performance | 1) Employee Performance Services, Community Online Services.  
2) Development Services, Application Management: Klik WA was developed into a Sprightly Crew.  
3) Population Service Innovation; Taksiyah  
4) Pecel Tumpang from sub-district level services is developed to support planning data as a mirroring of the Ministry of Home Affairs' system (MASTABUN); Labor Social Security and Worker Welfare insurance SIAGA KITA |  
The running application provides benefits to the community, facilitates the work of state employees, the community gets access to services  
Facilities for business and business premises; digital literacy of business actors, development of tourist destinations, inflation control. |
| 5.  | Smart Economy performance | 1) Development of Stalls in each sub-district, Development of business areas for MSMEs;  
2) Development and Training of Business to Consumer (B2C) Applications; Increasing Tourism Resources and Creative Economy, such as the Senja Parade Pecel Festival  
3) Development of local Facilities and Infrastructure such as promoukm.madiunkota.id; which can reduce inflation |  
Facilities for business and business premises; digital literacy of business actors, development of tourist destinations, inflation control. |
| 6.  | Smart Living performance | 1) Provision of Free Wifi for the community, Planting of Thematic flowering trees, Security Officers from Warriors  
2) Arrangement of village thematic villages; KIM in 27 sub-districts |  
Facilitate digital literacy, digitize public facilities and social facilities, comfort and peace. |
7. **Smart Society performance**

1) Student scholarship services, laptops for elementary-junior high school students, labor insurance guarantees, free school bus/public transportation.
2) Laptops for elementary-junior high school students;
3) **INLISLITE** and **iMadiun** (Digital Library)
4) **SMART MADIUN** (MADIUN City People's Scholarship)
5) **Sicaker** (job seeker application system)

Facilitation of intelligent communities, digitization of learning resources, utilization of applications in social services.

8. **Smart Environment performance**

1) Processing of waste into methane gas for cooking for residents, cleaners in each village, air humidity meter
2) Climate village; Clean, Healthy, Sustainable and Beautiful Villages (**KELURAHAN BERSERI**)
3) Data documentation supports indicators of achieving green city (**UIDCM**) and green leadership (**Nirwasita Tantra**)

Facilitation of intelligent communities, digitization of learning resources, utilization of applications in social services. Each activity has an impact on more than one area of life. Pollution index

9. **Smart Branding performance**

1) **PSC Tourism, Culinary and Cultural Festival**
2) **Domestic Tourism Promotion of the Archipelago**
3) Developing the concept of integrated religious tourism (**manasik**, lecture competitions, cultural festivals, etc.)

Facilitation of intelligent communities, digitization of learning resources, utilization of applications in social services.

Source: the Authors

The achievement of policy objectives is one measure of policy success. Besides being formulated democratically, policy goals must also have clear criteria, indicators, and parameters for achieving these policy objectives, including models, methods, and measurement instruments. In policy research both in the formulation, implementation, and evaluation of the obligatory law to measure achievement. Evaluation of the achievement of policy objectives relates to the extent to which the stated policy objectives can be achieved with the following parameters: (1) linkage with the objectives of the regional development plan; (2) achieving the goals set out in laws and regulations as the legal basis for policies; (3) indicators and parameters of macro development success.

Benefits are the of a policy that are received by the target of the policy. Smart city policy targets are state officials, civil servants, government stakeholders (private sector, civil society, community). Thus, evaluation of the benefits of the policy is meaningful insofar as the smart city policy provides benefits to state officials, civil servants and stakeholders. Therefore, the parameters for evaluating smart city policies are: (1) improving the government's image; (2) improving the image of state officials, (3) ease of state employee doing work; (4) state employee certainty in remuneration and career; (5) accessibility of public services; (6) public service standards; (7) multiplayer effects.
Smart city performance describes the overall results of the work of implementing smart city policies. Smart city performance is closely related to the achievement of smart city policy objectives and the benefits arising from community policies. Even though there are several theories of measuring organizational performance with input, process, output, outcome, impact, and benefit indicators and parameters, however, measuring the performance of smart city policies is almost the same as measuring development performance as stated in the regional development plan (Das et al., 2018; Ishida, 2015). Smart city performance evaluation means the extent to which the regional development plan targets as well as the key performance index (KPI) for each dimension of the smart city are achieved (Prabowo et al., 2020; Susanti et al., 2022). Therefore, smart city performance parameters are related to macro indicators, while smart city performance parameters per dimension are measured by main performance indicators and supporting indicators. Basically, the indicators and parameters of policy impact related to the achievement of goals, benefits and performance of smart cities can be formulated in terms of productive (achievement of goals and benefits of smart city) and smart (achievement of smart city performance).

3.4 THE ROLE OF ACTORS IN SMART CITY POLICY

Actors are one of the variables that determine the success of an organization in achieving policy goals. The main actors involved in the smart city policy process in Madiun City are state officials within the Madiun City government. Institutionally, the actors involved are the mayor, deputy mayor, parliament, and the Regional Apparatus Organization (OPD). Other actors participating in the smart city policy process, both individually and institutionally, include academics, the private sector, NGOs and journalists. In this research, actors who have involvement and participation in the smart city policy process are classified as state officials, OPD, and stakeholders.

In the smart city policy process in Madiun City, each actor has an important role in the successful achievement of policy objectives. The people and state employee of Madiun City are still dependent on a patrilineality society, so the top leaders in the community and government hierarchy are key actors in the successful achievement of policy objectives (Ardito et al., 2019). Therefore, the Mayor as the top leader of the Madiun City area has a role as the main figure for the successful achievement of policy objectives. Thus, the parameters for evaluating the role of the mayor actor are: (1) the role of the mayor in formulating policies, (2) the role of the mayor in implementing policies; (3) the role of the mayor in policy evaluation.
Parliament has three functions, namely legislation (formulation of regional regulations), budget (regional budget), and control (control or supervision of the implementation of regional regulations and other regulations and other government policies). The smart city policy in Madiun City has a juridical basis in the form of a Mayor’s regulation (Biswas, 2019). Therefore, in this smart city policy, the parliament has the role of carrying out the budget and control functions. Thus, the policy evaluation parameters depend on the juridical basis of smart city policies. If the basis for the smart city policy is a regional regulation, then the policy evaluation parameters concerning the role of the parliament are: (1) the role of the parliament in carrying out its legislative function; (2) the role of the parliament in carrying out the budget function, (3) the role of the parliament in carrying out the control function. If the smart city policy is based on a mayor regulation or regent regulation, then the parameters are: (1) the role of the parliament in carrying out the budget function and (2) the role of the parliament in carrying out the control function.

OPD and state employee are the main actors in carrying out the smart city policy process. Without the involvement of OPD and state employee a policy will not work. When there is rejection by some OPDs and state employees, the course of the policy will falter and it may fail to achieve policy objectives (Yigitcanlar et al., 2018). Therefore, OPD and state employee play an important role in determining the success of policy goals and processes. Thus, the parameters for measuring the success of evaluating OPD and state employee actors are: (1) the role of OPD in formulating policies; (2) OPD's role in implementing policies; and (3) OPD’s role in policy evaluation.

The government has limited budget and manpower in achieving goals and policy processes. In conditions of limited government, the policy process requires the participation of all parties, including the private sector, higher government, law enforcement officials, and society. Moreover, the private sector and the community in the policy process can become the target of policies, involvement (not just participation) is very important for the successful achievement of goals and policy processes. In research, this group is called stakeholders. Based on this reality, the evaluation parameters for stakeholder participation in the smart city policy process include: (1) the role of stakeholders in policy formulation, (2) the role of stakeholders in policy implementation; (3) the role of stakeholders in policy evaluation.
3.5 SMART CITY POLICY EVALUATION MODEL IN MADIUN CITY

Based on the results of evaluation research on public policies and criticisms and suggestions for improving and developing smart cities in Madiun City, the results can be summarized in Figure 3. The success of the City of Madiun in achieving its smart city policy goals is determined by the mayor (as an actor) and collaboration between other actors in the smart city policy process in Madiun City. The mayor is able to communicate well with the parliament so that he gets approval in making the budget for smart city programs. The mayor absorbs aspirations from the public and the private sector and communicates directly with the private sector and the public so that the private sector and the community participate in the smart city policy process. The mayor shows managerial competence so that he is able to mobilize and encourage OPD (state employee) to carry out smart city programs, activities and work creatively and innovatively. The mayor's managerial competence is demonstrated by attitudes and behaviors such as instructive giving, role modeling, performance management and e-performance (so that there is career certainty and remuneration).

Figure 3
Actor Collaboration in the Smart City Policy Process in Madiun City

The Madiun City parliament plays a role in carrying out the budget and control functions in the implementation and evaluation of smart city policies so that smart city programs and their budgeting can be accounted for (accountable), transparent, and effective and efficient. The private sector and the community participate in the form of thoughts and energy starting from the formulation, implementation and evaluation of smart city policies. OPD (state employee) with full creativity, innovation, integrity, professionalism, customer orientation, ICT-based, collaborative in the formulation, implementation and evaluation of smart city policies. Based
on the collaboration of smart city policy actors, Madiun City has an impact on achieving the goals and benefits of smart city policies. The objectives and benefits of the smart city policy are basically in line with the objectives of the Madiun City Regional Medium Term Development Plan (RPJMD) for 2019-2024. Smart City performance means achieving the goals and benefits of the RPJMD or Smart City both in a macro sense, namely achieving the HDI, LPE, GRDP, Gini Index, Open Unemployment Rate, Inflation Rate as well as in the micro terms in the government sector such as the SPBE Index, Performance index, SAKIP, Smart City Index, WBK index (Area Free from Corruption), WBBM Index (Clean and Serving Bureaucracy Area).

4 CONCLUSION

The evolution of Madiun City has been intricately intertwined with the shifting needs of its community and the rapid advancements in technology, particularly within the realm of information technology. In order to gauge the effectiveness of Madiun City's smart city policies, it becomes imperative to engage in a thorough evaluation. This evaluation encompasses a multifaceted approach, encompassing performance assessments, value elucidation, and methodical application. The evaluation process itself is a comprehensive endeavor that delves deep into the foundational pillars of the policy. This includes a meticulous analysis of the policy's objectives, the strategies employed to achieve them, and the ultimate outcomes observed. Furthermore, the roles and responsibilities vested in the various stakeholders participating in the policy-making process are meticulously examined. This comprehensive evaluation is facilitated through the application of the Smart City Policy Evaluation Model, a framework designed to ensure a holistic assessment.

The culmination of this evaluation sheds light on the efficacy of the smart city policy within Madiun City. It becomes evident that the policy has garnered success in fulfilling its primary objectives, which encompass enhancing the quality of life for residents, fostering economic expansion, and fortifying environmental sustainability.

However, this study also unearths a set of challenges that urban administrators encounter in their pursuit of implementing these transformative policies. The inadequacy of financial resources poses a significant hurdle, as does the imperative for improved coordination among diverse stakeholders. Additionally, devising more effective communication strategies that genuinely engage citizens in the policy-making process emerges as another critical area requiring attention.
In summation, this study presents an all-encompassing assessment of the Smart City Policy in Madiun City, Indonesia, under the meticulous scrutiny of the Smart City Policy Evaluation Model. While the evaluation underscores the policy's achievements, it also illuminates the obstacles that urban administrators grapple with in their quest to translate smart city aspirations into tangible realities. Beyond its evaluative nature, this study furnishes invaluable insights for policy makers and urban planners embarking on similar journeys, striving to infuse their cities with the essence of smart, sustainable, and people-centric development.

REFERENCES


