
IMPLEMENTATION OF SMART CITY DEVELOPMENT POLICY IN BANDUNG CITY, INDONESIA

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ABSTRACT

Purpose: Traffic congestion problems that occur in Bandung, Indonesia are suspected to be implemented using technology and information-based transportation system Smart City. Smart cities in several countries can overcome problems in the fields of economy, health, education, governance, transportation, and the environment. This research is designed to describe the implementation of smart city development policies in the city of Bandung.

Design/methodology/approach: This study uses qualitative. The object of this research is the implementation of smart city development policies implemented in the city of Bandung, Indonesia. The subjects of the study were Bandung City, Indonesia Transportation Department employees. Data collection techniques using the method of observation, interviews, and documentation. Data analysis techniques using data reduction, data presentation, and conclusion.

Findings: The results showed that: (1) Bandung city government website contains information about the city of Bandung, government, tourism, education, investment, maps, articles, prayer schedules, and weather forecasts. (2) Online public services for the aspirations and complaints of the people of Bandung. (3) RW Net services in the city of Bandung. BIRMS (Bandung Integrated Resource Management System) is an online public service in the form of integrated information, which is supported to help manage government resources. (2) Online public services for the aspirations and complaints of the people of Bandung. (3) RW Net services in the city of Bandung. BIRMS (Bandung Integrated Resource Management System) is an online public service in the form of integrated information, which is supported to help manage government resources. (2) Online public services for the aspirations and complaints of the people of Bandung. (3) RW Net services in the city of Bandung. BIRMS (Bandung Integrated Resource Management System) is an online public service in the form of integrated information, which is supported to help manage government resources.

Research limitations/implications: Results of this research can be used as references in implementing the smart city concept in other cities in Indonesia.

Practical implications: The use of technology is the key to implementing smart city policies in a city. The technology used does not have a negative impact on the environment, the technology is innovative and sustainable, is aware of the environment. Smart City is used to represent the ability of a city in providing services to the community by providing the information needed about the city

Originality/value: This research is original.

Paper type: Research paper

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I. INTRODUCTION

In the era of globalization, it is necessary to develop cities through various kinds of development innovations to increase urban competitiveness. Urban development requires city management to solve the problems that occur. A city has a complex problem, namely congestion on the highway.

In various countries, it has been able to overcome congestion problems through innovation with smart city policies. It is hoped that the smart city policy can help problems in the transportation sector. By utilizing technology in implementing smart city policies, it is hoped that it can make it easier for people to get information quickly and accurately. The formation of a smart city is a combination of a smart mindset and technology in an organization.

Smart City is defined as a concept of urban development and management by integrating ICT and IoT in a safe way to manage urban assets so as to maximize services to its citizens and support sustainable development effectively and efficiently. Smart cities can run well, if there is strong collaboration between the government and other stakeholders.

Problems related to the transportation system in the city of Bandung, Indonesia, namely:

1. The increase in vehicle volume that is not proportional to road capacity has also aggravated the transportation system in Bandung.
2. There is a comprehensive reforming system, starting from the line of government and society, needs to be implemented. Good city transportation management starting from the Trans Metro Bandung bus, namely the Bandung mayor's new transportation project, which was launched in 2008, turned out not to be as expected. The lifestyle of people who prefer to use private vehicles, this is because it starts from traffic jams, uncomfortable places, and the high crime rate in public transportation has an impact on transportation problems.
3. Unresolved poor transportation management in Bandung, West Java, Indonesia. Traffic jams are becoming more frequent, especially on weekends, thus disturbing the accessibility of residents.

The city of Bandung, West Java, Indonesia is the most congested city in Indonesia or ranks 14th most congested in Asia based on a survey conducted by the Asian Development Bank (ADB).

Figure 2.2.2 Relative congestion of natural cities with population greater than 5 million

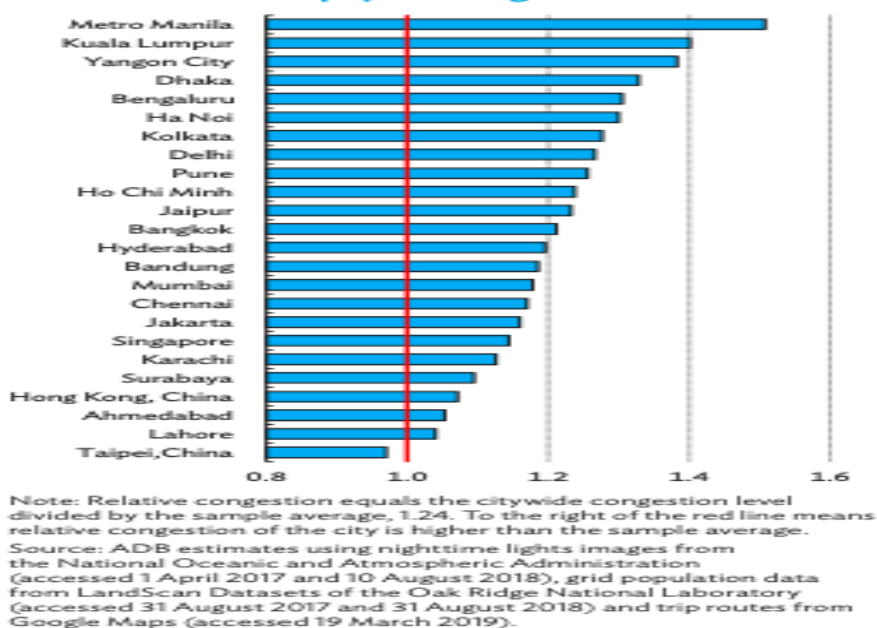


Figure 1. Data on the most congested cities in Asia in the Asian Development Outlook 2019

from the Asian Development Bank (ADB)

The problem of traffic congestion that occurred in Bandung, West Java, Indonesia can be resolved by applying a technology-based transportation system and information Smart City. Based on data from the Central Statistics Agency, the increase in motorized vehicles over the last five years (2010 - 2014) has reached 9.93 percent per year. One of the goals of a smart city is to reduce traffic congestion (C. Benevolo et al. 2016).

Various problems in the field of mobility and transportation, namely the inconvenience of using public transportation, for example, unscheduled departure schedules, unworthy modes of transportation, unscrupulous drivers, congestion and congestion on the roads due to infrastructure development.

Given the above problems, it is necessary to have a public policy, namely the smart city policy. The implementation of smart city policies will run well if the policies are well planned.

Examining the phenomena in the development of a Smart City in Bandung, Indonesia, the problem formulation:

1. How is the implementation of the smart city development policy in Bandung, Indonesia?

The purpose of writing this scientific paper is to obtain a smart city concept, to find out data and information as well as the implementation of smart city development policies in Bandung City, Indonesia.

II. METHODOLOGY

The subject of this research was carried out on employees at the Bandung City Department of Transportation, Indonesia. The object of this research is the Implementation of Smart City Development Policy in Bandung City, Indonesia. Data collection techniques used the method of observation, interviews and documentation (Miles & Huberman, 1984); (Moleong, 2012).

This type of research method is qualitative research. Bogdan & Robert (1992) explain that qualitative research is "a research procedure that produces descriptive data in the form of oral or written forms and the behavior of the people being observed".

This research method is used to collect data using literature studies conducted to collect, study theories, rules, information obtained from books and document reviews in the form of journals, books and papers related to research problems.

Qualitative research is research that is used to examine the condition of natural objects, where the researcher is the key instrument (Sugiyono, 2008). According to Moleong (2012), qualitative research is research that aims to understand the phenomena experienced by research subjects such as behavior, perception, motivation, action, and more holistically, and by means of descriptions in the form of words and language, in context naturally and by using various natural methods.

According to Sugiyono (2008), qualitative research is research that is used to investigate, find, describe, and explain the qualities or features of social influences that cannot be explained, measured or explained through a quantitative approach. Qualitative research is a research method based on post-positivism philosophy, used to examine the condition of a natural object (as opposed to an experiment) where the researcher is the key instrument, the sampling of data sources is purposive and snowball, the collection technique is tri-accounting combined), data analysis is inductive or the results of qualitative and qualitative research emphasize meaning rather than generalization.

III. RESULTS AND DISCUSSION

A. Result

The concept of smart city has 6 (six) characteristics, namely smart governance, smart economy, smart mobility, smart environment, smart people, and smart living (supported by advances in information technology).

According to Edwards (1980), developing a top-down policy implementation model known as "direct and indirect impact on implementation", there are four variables that determine the success of public policy implementation, namely communication, resources, disposition and bureaucracy.

Before implementing policy implementation, we should first formulate policies, implement policies, evaluate policies and revise policies. The general policy process includes policy issues, policy implementation, policy monitoring, policy performance, policy evaluation, policy revision or discontinuation of policies, policy continuation.

The implementation of smart city policies in Bandung, Indonesia, is in the transportation sector. Some of the information applied by smart city Bandung includes:

Bandung city government website

education, investment, maps, articles, prayer times and weather forecasts.

RW Net services in Bandung City.

B. Discussion

Implementation studies are also related to the implementation process of a policy. Policy implementation is a complex and politically charged process with interventions of various interests.

Bardach is quoted by Agustino (2016) in his book "Basics of Public Policy" as follows: "Implementation is enough to make a program and general policy that looks good on paper. It is even more difficult to formulate with words and slogans that sound like they wear to the ears of the leaders and the voters who hear them. And it is even more difficult to implement it in a way that satisfies everyone including those they consider clients. "

It should be noted that policy implementation is a very important stage in the policy structure, because through this procedure the policy process as a whole can be influenced by the level of success or failure in achieving objectives. The definition of policy implementation according to Mufizz quoted by DelCampo (2010) in his book "Introduction to State Administration Science (a Subject)" is as follows: "Policy implementation is the activities undertaken to implement a policy effectively. The difficulty that arises at this stage is the difficulty in determining the outcome of the policy, because there are impacts that were not previously anticipated. "

George C. Edward III developed a top-down policy implementation model known as "direct and indirect impact on implementation". There are four variables that determine the success of public policy implementation, namely

1. Communication. Communication is one of the important variables that influence public policy implementation. Communication is critical to the success of achieving the goals of implementing public policies. There are three indicators that can be used in measuring the success of communication variables according to Edward III in Agustino, namely:
 - a. Transmission. Communication channels must be good so that policy implementation can run smoothly and does not cause miscommunication or misunderstanding. Miss communication is caused by the many levels of bureaucracy in the communication process.
 - b. Clarity. Communication should be clear and unambiguous.
 - c. Consistency. The instructions given must be consistent and clear and must be stable so as not to cause confusion.
2. Resource. Resources (resources) need to be met because they determine the success of an organization. An expert in the field of resources, Jr., Hunt, & Osborn (1993) grouped resources into: "Information, Materials, Equipment, Facilities, Money, People". Edwards (1980) categorizes organizational resources consisting of: "Staff, information, authority, facilities; building, equipment, land and supplies ". Edwards (1980) argues that these resources can be measured from the aspect of their adequacy, which implies suitability and clarity. According to Edward III in Agustino (2016), resources are important in implementing good policies. Indicators are used to see the extent to which resources affect policy implementation.
3. Disposition. According to Edward III in Winarno (2004) states: "tendencies or dispositions are one of the factors that have important consequences for effective policy implementation". The existence of support for policy implementation is a determining factor for the implementation of policy implementation in accordance with the previous plan / decision.
4. Bureaucracy. The bureaucracy is the executor of activities. The bureaucracy is in the structure of government, private organizations, educational institutions and so on. The bureaucracy was created only to carry out a certain policy. According to Edwards III in Winarno there are two main characteristics of bureaucracy, namely: "Standard Operational Procedure (SOP) and fragmentation". "Standard operational procedure (SOP) is the development of internal demands for certainty of time, resources and the need for uniformity in a complex and broad work organization".

Dye (2016) defines public policy as "Whatever governments choose to do or not to do.", namely everything or whatever the government chooses to do or not do. Edwards (1980) defines public policy as the allocation of power values to all binding societies. Only the government can take action to society.

Edwards (1980) defines public policy as "An sanctioned course of action addressed to a particular problem or group of related problems that affect society at large." The point is an act of sanction that leads to a specific goal directed at a particular problem or group of interrelated problems that affect the majority of society. On another point of view, Hakim (2003) argues that Public Policy Studies studies government decisions in overcoming a problem.

Davis, Althaus, & Bridgman (2012) explain that public policy has at least three interrelated dimensions, namely as an objective (objective), as a choice of legal or legal action (authoritative), and as a hypothesis (hypothesis).

1. Public policy as an objective

Policy is a means to an end, a means to an end. Public policy is ultimately about achieving public goals. That is, public policy is a set of government actions designed to achieve certain results expected by the public as a constituent of government. A good policy avoids this trap by formulating explicitly:

- a. An official statement regarding the choices of action to be taken.
- b. The cause and effect model that underlies policy.

c. The results will be achieved within a certain time.

In order for policy to remain focused on predetermined goals, policy-making must be based on a cycle of policy stages that includes planning and evaluation.

2. Public Policy as a Legal Choice of Action

The choice of action in policy is legal because it is made by an institution that has legitimacy in the government system. Public policies include:

a. Destination. Public policy concerns the achievement of government objectives through the application of public sources.

b. Decision. Making decisions and examining their consequences.

c. Structure. Structured with clear and measurable players and steps.

d. Action. Actions of a political nature expressing the choice of priority programs of the executive branch.

3. Public Policy as a Hypothesis

Policies are made based on theories, models or hypotheses about cause and effect. An American policy analyst, Aaron Wildavsky stated that 'we hope that new hypotheses can be developed into theories that are able to better explain reality' (Davis et al., 2012). Good theories which are supported by evaluation results are the basis upon which to improve public policies.

The general policy process, namely as follows: there is an issue, both in the form of a common problem and a common goal, defined as a policy issue. With this policy issue, public policies are formulated and stipulated. This policy is then implemented or policy implementation. In policy implementation, there is a monitoring or monitoring process so that it is consistent with policy formulations.

The result of policy implementation is policy performance. It is at this time that policy evaluation is required. The first evaluation relates to the performance of the policy, namely how far the policy has achieved the expected results. Furthermore, parallel evaluations are carried out on policy implementation, policy formulation, and the environment in which policies are formulated, implemented, and performed. The results of the policy evaluation must choose either repair or revision of the policy or termination of the policy.

The following are models of public policy implementation:

1. Van Meter and Van Horn models. The first model is the most classic model, namely the model introduced by Van Meter & Van Horn (1975). This model assumes that policy implementation runs linearly from public policy, implementer, and public policy performance.
2. Mazmanian and Sabatier model. Mazmanian & Sabatier (1983) who argue that implementation is an effort to implement policy decisions. Mazmanian and Sabatier's model is called a framework for implementation analysis. Mazmanian-Sabatier classifies the policy implementation process, namely: independent variables, intervening variables, and dependent variables.
3. Hogwood and Gunn models. The third model is Brian W. Hogwood and Lewis A. Gunn's (1978) model, to be able to implement policies perfectly, certain requirements are needed, namely: External conditions faced by implementing agencies / agencies will not cause serious disturbances / obstacles, to the implementation of the program provided sufficient time and resources.
4. Goggin's model. Malcolm Goggin, Ann Bowman, and James Lester developed a "communication model" for policy implementation which he called the "third generation model of policy implementation" (Goggin, Bowman, Lester, & O'Toole, 1990). Goggin and his friends aim to develop a more scientific policy implementation model by promoting a research method approach with the presence of independent, intervening, and dependent variables, and placing communication as a driving force in policy implementation.
5. Grindle Model. The fifth model is the Grindle (1980) model. The Public Policy Implementation Model put forward by Grindle (1980) states that the success of the policy implementation process depends on program activities and funding, apart from being influenced by the Content of Policy (content of the policy) and the Context of Implementation (the context of its implementation).
6. Elmore's model, et al. The sixth model is a model compiled by Grindle (1980), Minshall, Seldon, & Probert (2007). This model starts from identifying the network of actors involved in the service process and asking them: their goals, strategies, activities, and contacts. Elmore's model policies are generally initiated by the community (NGOs).
7. Edward's model. Edwards (1980) emphasized that the main problem of public administration is lack of attention to implementation. He said, without effective implementation the decision of policymakers will not be carried out successfully. Edward suggests paying attention to four main issues for effective policy implementation, namely communication, resources, disposition or attitudes, and bureaucratic structures.
8. Nakamura and Smallwood models. Nakamura and Smallwood's model describes the policy implementation process in detail. So detailed, so that this model is relatively relevant to be implemented in all policies.

Policy Makers : Environment I – Policy Formulation	Policy Implementers : Environment II – Policy Implementation	Potential Breakdowns
1. Classical Technocracy		
a. Policy makers formulate specific goals b. Policy makers delegate technical authority to implementers to achieve goals.	a. Implementers support policy makers goal and devise technical means to achieve these goals.	a. Technical failures of means
2. Instructed Delegation		
a. Policy makers formulate specific goals b. Policy makers delegate administrative authority to implementers to devise the means to achieve goals	a. Implementers support policy makers goals and negotiate administrative means among themselves to achieve goals	a. Technical failure of means b. Negotiation failures (complexity, stalemate)
3. Bargaining		
a. Policy makers formulate goals b. Policy makers bargain with implementers over both goals and/ or means to achieve goals	a. Implementers bargain with policy makers over goals and/ or means to achieve goals	a. Technical failure of means b. Bargaining failures (stalemate, non-implementation) c. Cooptation or cheating
4. Discretionary Experimentation		
a. Policy makers support abstract (underlined) goals b. Policy makers delegate broad discretionary authority to implementers to refine goals and means	a. Implementers refine goals and means for policy makers	a. Technical failures of means b. Ambiguity c. Cooptation d. Unaccountability
5. Bureaucratic Entrepreneurship		
a. Policy makers support goals and means formulated by implementers	a. Implementers formulate policy goals and means to carry out goals and persuade policy makers to accept their goals	a. Technical failure of means b. Cooptation c. Unaccountability d. Policy preemption

Figure 2. Model Nakara and Smallwood

9. Network Model. This model understands that the policy implementation process is a complex of interaction processes between a large number of actors in a network of independent actors. It is the interaction between actors in the network that will determine how implementation should be carried out, the issues that must be addressed, and the discretions that are expected to be an important part of it.
10. Matland model. Matland (1995) developed a model called the Conflict-Ambiguity Matrix Model which explains that administrative implementation is the implementation that is carried out in the daily operations of the government bureaucracy. The policy here has low ambiguity or ambiguity and low conflict.

The concept of smart city explains that a city will be smart if investment in human resources and social capital as well as infrastructure for traditional and modern communication systems can improve sustainable economic growth and quality life, with wise management of natural resources, through participatory governance and able to serve the community well (Caragliu, Del Bo, & Nijkamp, 2011).

A smart city can also be represented as a smart city (smart and fast), smart in acting and immediately executing until a problem is resolved properly. The concept of energetic involves three components, namely technology, processes and people (Caragliu et al., 2011).

Smart city literally means smart city, which is a concept of developing, implementing, and implementing technology applied in an area as a complex interaction between the various systems in it (Pratama, 2014). The goal of the smart city approach is to achieve integrated city information and management. This integration can be through the management of urban geography digital networks, resources, environmental, economic, social and others. The structure of a smart city includes the perception layer, network layer and application layer, which can make the world's future more adequate and scalable, more interconnected and interoperable and smarter (Edwards, 1980).

In order for the better governance of Bandung City, Indonesia, namely by integrating facilities, infrastructure and society through technology. In addition, there is an effective and efficient human resource management.

There are six dimensions that support a smart city based on Giffinger, 2007, including:

1. Smart Economy (smart economy), the existence of business innovations to increase business opportunities and economic competitiveness.
2. Smart People (smart people), development always has an object, namely the community where the community should be able to care and participate in the development in the city / environment.
3. Smart Governance (smart government), is related to the transparency of policies to the public in the form of easy access for the public to public documents.
4. Smart Mobility (smart mobility), the use of infrastructure based on sustainable technology which makes it easier for actors to interact.
5. Smart Environment, the application of sustainability in every urban activity which can identify and solve environmental and resource problems.
6. Smart Living (smart life), the existence of a society and community that is healthy, cultured, and smart.

With the existence of information and communication technology (ICT) for the development of a smart city it can be applied in the environment to help solve problems such as traffic jams. Smart cities use Information and Communication Technology (ICT) data to:

1. Manage and optimize existing infrastructure investments and plan new investments more effectively.
2. Provide more efficient, new, or improved services for citizens.
3. Reducing organization in city services and creating new levels of cross-sector collaboration.
4. Help cities and government progress towards meeting climate change mitigation and adaptation goals.
5. Activate innovative business models for public and private sector service delivery.

By aligning stakeholder interests and using new technology and market mechanisms, cities will be better able to capture the full value of the Information and Communication Technology investments made to become smart cities.

In implementing the smart city policy so that it can run smoothly and successfully, the potential of the area must first be considered and an in-depth study is carried out. Application of smart city in Bandung, Indonesia, among others, is in the field of transportation to solve congestion problems, regulations on parking, traffic monitoring, public transportation, or city fleet management.

There are various kinds of information that can be implemented in the smart city of Bandung, Indonesia, including:

1. Bandung city government website, Indonesia which contains information about the city of Bandung, government, tourism, education, investment, maps, articles, prayer schedules and weather forecasts.
2. Online public service for the aspirations and complaints of the people of Bandung, Indonesia.
3. RW Net services in Bandung, Indonesia. BIRMS (Bandung Integrated Resources Management System) is an online public service in the form of integrated information, which aims to help manage government resources.

The use of technology is the key to implementing smart city policies in a city. The technology used does not have a negative impact on the environment, the technology is innovative and sustainable, is aware of the environment. Smart City is used to represent the ability of a city in providing services to the community by providing the information needed about the city (Hakim, 2003).

IV. CONCLUSION

The concept of smart city has 6 (six) characteristics, namely smart governance, smart economy, smart mobility, smart environment, smart people, and smart living. One of implementation of smart city policy in Bandung, Indonesia, namely in the transportation sector. Smart cities can be implemented in Bandung, Indonesia, including:

1. Bandung city government website, Indonesia which contains information about the city of Bandung, government, tourism, education, investment, maps, articles, and weather forecasts.
2. Education, investment, maps, articles and weather forecasts. Online public service for the aspirations and complaints of the people of Bandung, Indonesia.
3. RW Net services in Bandung, Indonesia. BIRMS (Bandung Integrated Resources Management System) is an online public service in the form of integrated information, which aims to help manage government resources.

REFERENCES

Agustino, L. (2016). *Dasar Dasar Kebijakan Publik*. Bandung: Alfabeta.

- Bogdan, & Robert. (1992). *Introduction to Qualitative Research Methods: A Phenomenological Approach in the Social Sciences*. Surabaya: Usaha Nasional.
- Caragliu, A., Del Bo, C., & Nijkamp, P. (2011). Smart Cities in Europe. *Journal of Urban Technology*, 18(2), 65–82. <https://doi.org/10.1080/10630732.2011.601117>
- Davis, G., Althaus, C., & Bridgman, P. (2012). *The Australian Policy Handbook*. Allen and Unwin.
- DelCampo, R. G. (2010). Administrative Sciences: An International Journal on the Science of Administration. *Administrative Sciences*, 1(1), 1–2. <https://doi.org/10.3390/admsci1010001>
- Dye, T. R. (2016). *Understanding Public Policy* (15th ed.). New Jersey: Pearson.
- Edwards, G. C. (1980). *Implementing public policy*. Washington, D.C.: Congressional Quarterly Press.
- Goggin, M. L., Bowman, A., Lester, J., & O'Toole, L. (1990). *Implementation Theory and Practice: Toward a Third Generation*. Scott Foresman & Co.
- Grindle, M. S. (1980). *Politics and Policy Implementation in the Third World*. New Jersey: Princeton University Press.
- Hakim, R. (2003). *Komponen Perancangan Arsitektur Lansekap*. Jakarta: Earth Literacy.
- Jr., J. R. S., Hunt, & Osborn, R. N. (1993). *Managing Organizational Behavior (Wiley Series in Management)* (5th ed.). Canada: Wiley.
- Matland, R. E. (1995). Synthesizing the Implementation Literature: The Ambiguity-Conflict Model of Policy Implementation. *Journal of Public Administration Research and Theory: J-PART*, 5(2), 145–174. Retrieved from <https://www.jstor.org/stable/1181674>
- Mazmanian, D. A., & Sabatier, P. A. (1983). *Implementation and Public Policy*. New York: HarperCollins.
- Miles, M. B., & Huberman, A. M. (1984). *Qualitative Data Analysis: A Sourcebook of New Methods*. California: SAGE Publications, Inc.
- Minshall, T., Seldon, S., & Probert, D. (2007). Commercializing A Disruptive Technology Based Upon University Ip Through Open Innovation: A Case Study Of Cambridge Display Technology. *International Journal of Innovation and Technology Management*, 4(3), 225–239. <https://doi.org/10.1142/S0219877007001107>
- Moleong, L. J. (2012). *Metodologi penelitian kualitatif*. Bandung: Remaja Rosdakarya.
- Pratama, I. P. A. E. (2014). *Sistem Informasi Dan Implementasinya*. Bandung: Informatika.
- Sugiyono. (2008). *Metode Penelitian Kualitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- Van Meter, D. S., & Van Horn, C. E. (1975). The Policy Implementation Process. *Administration & Society*, 6(4), 445–488. <https://doi.org/10.1177/009539977500600404>
- Winarno, B. (2004). Implementasi Konsep Reinventing Government Dalam Pelaksanaan Otonomi Daerah. Retrieved from [researchgate.net](https://www.researchgate.net) website: https://www.researchgate.net/publication/279509434_IMPLEMENTASI_KONSEP_REINVENTING_GOVERNMENT_DALAM_PELAKSANAAN_OTONOMI_DAERAH