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The Effectiveness Of Electronic Parking By The Samarinda City Transportation Department (Case Study: KH. Khalid Street, Pasar Pagi)

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Abstract

Abstract: The concept of a smart city refers to an urban planning approach that utilizes technological advancements to improve the quality of public services, transparency, and governmental accountability. The implementation of this concept is expected to effectively and efficiently address various urban problems. Samarinda City, as one of the cities adopting the smart city concept, implements it through various service innovations, one of which is the electronic parking system (E-Parking) managed by the Samarinda City Transportation Agency. This study aims to analyze the effectiveness of the implementation of the electronic parking (E-Parking) system, with a case study on KH. Khalid Street, Pasar Pagi, which has a high level of community activity. This research uses a qualitative approach with a descriptive research type. Data collection techniques include observation, interviews, and documentation. Data analysis employs the policy effectiveness theory proposed by Riant Nugroho, which includes indicators such as appropriate policy, appropriate implementers, appropriate targets, appropriate environment, and appropriate process. The results show that, normatively, the E-Parking policy has been implemented and has contributed to increasing local revenue as well as supporting smart city principles. However, in practice, several obstacles are still found, such as the dominance of cash transactions, limited availability of EDC devices, and suboptimal monitoring and supervision. Other inhibiting factors include limited human resources, community habits, and lack of consistency among field implementers. Therefore, it can be concluded that the effectiveness of E-Parking implementation has not yet been optimal.

Introduction

A common problem in major cities is parking. Parking has become one of the key issues requiring serious attention. One indicator of good governance is the ability to resolve various public service issues. Traffic congestion, which frequently occurs in urban areas, is largely caused by inefficient conventional parking systems. Governments have begun implementing various innovations by striving to integrate community-needed public services with the help of technology (Romasi & Ridwan, 2023). Therefore, an integrated approach is essential to address various urban challenges, leading to the emergence of the smart city concept (Ramdani, 2023). Pratama in (Nurmawan et al., 2021) states that a smart city is a

concept of development and the application of technology implemented in a region to facilitate complex interactions among the systems within it. A smart city promotes urban sustainability to meet current community needs without compromising the community's ability to meet future needs, supported by technological innovation (Nuraini, 2024). The concept of a smart city encompasses more than just the use of ICT, where ICT is often viewed as a means to achieve better city services or more efficient city administration (Pradana et al., 2021).

Table 1: Number of Vehicles in Samarinda City and East Kalimantan

Regency/ City	Number of Motor Vehicles (Passenger Cars)	Number of Motor Vehicles (Buses)	Number of (Trucks)	Number of Motor Vehicles (Motorcycles)	Number of Motor Vehicles - Total
Samarinda City	97,885	7,006	64,179	993,224	**1,163,096**
East Kalimantan	383,157	17,156	385,594	3,149,745	**3,941,251**

Data source: *Central Statistics Agency, 2023*

Based on the data from the Central Statistics Agency above, it is evident that in Samarinda City alone, the number of motor vehicles has reached 1,163,096. The increase in the number of vehicles in the Samarinda City area has led to a growing need for parking spaces. As the public becomes more educated and increasingly informed, there is a growing tendency to demand higher standards of public services from the government and other service providers (Suparno & Kamuli, 2022). Parking issues have become a critical concern within the urban transportation system, particularly in high-activity areas such as commercial and service centers. In Samarinda City, this situation is evident in the Pasar Pagi area, particularly on KH. Khalid Street, which frequently experiences parking congestion, disorderly vehicle parking, and potential revenue leakage from parking fees. These conditions not only contribute to the decline in the quality of public services but also to traffic congestion and reduced public comfort in daily activities. To address these issues, the Samarinda City Government, through the Transportation Department, has developed a technology-based service innovation in the form of an electronic parking system (E-Parking). The implementation of E-Parking is part of the smart city concept, a city management approach that leverages information and communication technology to enhance public service quality, transparency, and accountability (Hasibuan & Sulaiman, 2019). This concept emphasizes the integration of technology into government administration to create a service system that is more effective, efficient, and responsive to community needs. This policy is also supported by Samarinda Mayor Regulation No. 26 of 2022 on cashless parking management, which aims to improve efficiency and optimize Local Revenue.

Conceptually, E-Parking is expected to minimize revenue leakage and enhance transparency in parking management. When a provided service satisfies predetermined criteria, it signifies that the needs of the community have been addressed, thereby contributing to overall user satisfaction (Danial et al., 2024). Additionally, this system is also expected to provide convenience for the public in making cashless parking payments and

improve the accuracy of parking management data (Pahlevi & Jumansyah, 2023). With a digital system, local governments can conduct more measurable and real-time monitoring of parking fee revenue (Putri et al., 2022).

Although various previous studies have examined the implementation of E-Parking systems in improving transparency and local revenue, most of these studies still focus on normative aspects and general policy success, and have not yet thoroughly examined the effectiveness of implementation at the operational level, particularly in high-activity areas such as the Pasar Pagi district. Furthermore, research specifically linking E-Parking implementation to policy effectiveness indicators based on Riant Nugroho's perspective remains relatively limited. Therefore, this study aims to address this gap by conducting a more comprehensive analysis of the effectiveness of E-Parking implementation based on the indicators of Riant Nugroho.

Based on this, this study aims to analyze the effectiveness of E-Parking implementation by the Samarinda City Transportation Agency using a case study on KH. Khalid Street, Pasar Pagi. The analysis was conducted using Riant Nugroho's policy effectiveness theory, which encompasses the indicators of appropriate policy, appropriate implementer, appropriate target, appropriate environment, and appropriate process. The selection of this research location was based on the area's characteristics, which feature high activity levels and significant parking-related complexities, making it representative of E-Parking implementation conditions in Samarinda City.

Method

This study employs a qualitative approach with a descriptive research design. This approach was chosen to deeply understand the phenomenon of E-Parking policy implementation and to systematically and factually describe the conditions observed in the field. The research was conducted on KH. Khalid Street, Pasar Pagi, Samarinda City, is one of the areas with high parking activity levels. Data collection techniques in this study included observation, interviews, and documentation (Sugiyono, 2019). Observations were conducted to directly observe the conditions of E-Parking implementation at the research site. In-depth interviews were conducted with relevant informants, such as officials from the Samarinda City Transportation Agency, parking attendants, and members of the public who use parking services. Documentation was used to supplement data in the form of archives, reports, and regulations related to the E-Parking policy. Informant selection was conducted using purposive sampling, which involves selecting informants based on specific criteria deemed knowledgeable and directly involved in policy implementation. This aims to obtain accurate and relevant data aligned with the research needs. Data analysis in this study employs an interactive analysis model comprising data reduction, data presentation, and drawing conclusions. To ensure data validity, this study employed source triangulation and methodological triangulation. The study utilized Riant Nugroho's policy effectiveness theory as an analytical framework, encompassing the indicators of appropriate policy, appropriate implementers, appropriate targets, appropriate environment, and appropriate process. These indicators were used to assess the extent to which the implementation of the E-Parking policy by the Samarinda City Transportation Agency was effective in supporting technology-based public services.

Result and discussion

1. Appropriate Policy

The indicator of appropriate policy by Riant Nugroho refers to the extent to which a policy is able to address the problems it is intended to solve and is supported by a clear legal and conceptual foundation (Nugroho, 2018). Based on the research findings, the policy to implement an electronic parking system (E-Parking) by the Samarinda City Transportation Agency can be categorized as a policy that is conceptually appropriate for addressing parking issues in urban areas, particularly on KH. Khalid Street, Pasar Pagi. The parking problems that have long existed, such as disorderly vehicles, traffic congestion, and the potential for leakage of parking revenue, require policy innovations capable of enhancing the effectiveness of parking management. In this context, E-Parking serves as a form of transformation from a conventional system to a more transparent and accountable digital-based system. The E-Parking policy also aligns with the Samarinda City Government's efforts to implement the smart city concept, where the utilization of information technology serves as a primary instrument in improving the quality of public services. With the cashless payment system, it is hoped that parking management will become more orderly, measurable, and capable of minimizing potential leakage of Local Government Revenue. Furthermore, this policy has a clear legal basis, namely Samarinda Mayor Regulation No. 26 of 2022 on cashless parking management, thereby ensuring strong normative legitimacy for its implementation.

However, although this policy is deemed appropriate in substance, research findings indicate that its implementation on the ground has not yet fully aligned with the intended objectives. This is evident from the continued dominance of cash payment methods compared to the cashless system, which should be the primary focus of E-Parking. This situation indicates that the policy transformation from a conventional system to a digital system has not been fully realized. Furthermore, the appropriateness of the policy can also be assessed by how well it addresses actual needs and conditions on the ground. In this regard, although E-Parking was designed to enhance efficiency and transparency, it has not fully accounted for the readiness of the public and on-site personnel to adapt to the technology. This is evident from the continued resistance among parking users who prefer to use cash, as well as the limited understanding of parking attendants in operating digital devices.

According to Riant Nugroho's policy effectiveness theory, a policy can be considered effective if it is not only appropriate in formulation but also supported by consistent implementation and readiness of stakeholders involved. The findings of this study indicate that although the policy is appropriate in substance, its implementation has not yet been fully supported by adequate readiness among both the community and field implementers. This situation is further reinforced by previous studies. For instance, (Putri et al., 2022) found that the effectiveness of E-Parking implementation is highly dependent on the level of public adoption of cashless systems. Similarly, (Calcabilla & Dyastari, 2022) emphasized that the transition from conventional to digital parking systems often faces challenges related to user habits and implementation consistency.

Therefore, it can be concluded that, based on the policy appropriateness indicators, the implementation of E-Parking in Samarinda City, particularly on KH. Khalid Street is conceptually and normatively appropriate. However, there remains a gap between the policy design and the reality of implementation on the ground. Therefore, adjustments and policy

strengthening are needed to make the policy more adaptive to the social and technical conditions on the ground so that policy objectives can be optimally achieved.

2. Appropriate Implementer

The indicator of an appropriate implementer in policy effectiveness theory of Riant Nugroho refers to the suitability of the actors involved in policy implementation, in terms of capacity, competence, and commitment to carrying out the policy (Nugroho, 2018). In the context of E-Parking implementation in Samarinda City, the Samarinda City Transportation Agency is the primary actor with the authority to design, manage, and oversee the implementation of this policy. Institutionally, the Transportation Agency has fulfilled its role by providing the systems, equipment, and supporting regulations for E-Parking implementation.

However, in field implementation, the success of this policy is not only determined by the role of the agency but also heavily depends on the performance of parking attendants as the direct implementers who interact with the public. Based on the research findings, several obstacles were still found in the implementation aspect, particularly related to limited technological skills and understanding of parking attendants regarding cashless payment systems. Some parking attendants are still not familiar with operating Electronic Data Capture (EDC) devices and digital payment mechanisms, so in practice, they tend to return to conventional methods such as cash payments. In addition, consistency in implementation is also a significant issue. Although the policy regulates the use of cashless systems, there are still officers who continue to accept cash payments from the public. This condition indicates that the commitment of implementers in carrying out the policy has not been fully optimal. The lack of discipline in enforcing the rules causes the main objectives of the policy, namely transparency and accountability in parking management, to not be fully achieved.

According to Riant Nugroho, the success of a policy is not only determined by the appropriateness of the policy itself but also by the implementers who must have the capacity and commitment to implement the policy consistently. If implementers do not have adequate readiness, even a well-designed policy will be difficult to achieve effectively. In this study, although the implementers are structurally appropriate, the capacity of human resources in the field still does not fully support the successful implementation of E-Parking. This finding is in line with the study of (Pahlevi & Jumansyah, 2023), which states that the implementation of non-cash parking policies in Samarinda City still faces obstacles related to the readiness of field implementers, especially in adapting to digital systems and weak supervision. In addition, the study also shows that the success of the E-Parking program is strongly influenced by the readiness of human resources, especially field officers who directly play a role in implementing the policy.

Therefore, it can be concluded that, based on the appropriate implementer indicator, the implementation of the E-Parking policy in Samarinda City has not been fully optimal. Although the policy implementers are institutionally appropriate, the capacity, consistency, and commitment of field implementers still need to be improved. Therefore, efforts are needed to improve the quality of human resources through continuous training, technical assistance, and more intensive supervision so that policy implementation can run in accordance with the established objectives.

3. Appropriate Target

The target alignment indicator in policy effectiveness by Riant Nugroho refers to the alignment of policy objectives with the problems intended to be addressed, as well as the extent to which the policy can reach the primary target groups (Nugroho, 2018). In the context of E-Parking implementation in Samarinda City, the primary targets of this policy are parking users and parking attendants in high-activity areas, particularly on KH. Khalid Street. Based on the research findings, the selection of the E-Parking implementation location in this area can be considered appropriate because KH. Khalid Street is one of the economic centers with high vehicle volume and significant parking activity, thus holding significant potential for the implementation of a digital parking system. With these characteristics, the implementation of E-Parking is expected to reduce parking disorder, improve traffic flow, and increase transparency in parking revenue management. The policy target is therefore appropriate in terms of both location and the scope of the problem being addressed. The policy is designed to respond directly to the challenges of conventional parking management, such as revenue leakage, lack of supervision, and inefficient payment systems.

However, although the policy targets have been appropriately defined, its implementation still faces challenges related to the readiness and acceptance of the public as the primary target of the policy. Some parking users are still accustomed to using cash payment methods and have not fully understood the mechanisms of using non-cash systems. This indicates that the public's level of digital literacy remains a challenge in the implementation of technology-based policies. Additionally, not all members of the community have access to cashless payment instruments such as electronic cards or digital payment applications. This situation shows that the E-Parking policy is not yet fully inclusive and has not been able to optimally reach all segments of society. As a result, cash payments still dominate in practice, even though the policy has shifted toward a non-cash system. From the perspective of target implementers, namely parking attendants, there are also challenges related to readiness and adaptation to the new system, which further affects the effectiveness of policy implementation.

According to Riant Nugroho, policy targets must not only be clearly defined but must also be supported by the readiness and capacity of the target groups to accept and implement the policy. A policy may be well-targeted in theory, but if the target group is not ready to adapt, the policy will not achieve its intended effectiveness. This study shows that although the target determination is appropriate, the readiness of both the public and field implementers remains insufficient. These findings are consistent with the study by, which found that the effectiveness of E-Parking in Bungkul Park, Surabaya City, implementation is highly influenced by public understanding and participation in using digital payment systems. Similarly, Mawuntu et al. (2022) explained that resistance to behavioral change and limited access to digital payment systems often become major obstacles in the successful implementation of E-Parking in Samarinda City.

Therefore, it can be concluded that, based on the appropriate target indicator, the E-Parking policy in Samarinda City is appropriate in terms of target determination, location, and policy objectives. However, the readiness and acceptance of the target groups have not yet fully supported the effectiveness of the policy. Therefore, stronger public outreach, increased digital literacy, and the provision of more inclusive supporting facilities are needed so that

the E-Parking policy can reach all target groups more effectively and achieve its intended objectives.

4. Appropriate Environment

The Appropriate environmental indicator in policy effectiveness by Riant Nugroho's theory refers to the suitability of both internal and external environmental conditions in supporting the successful implementation of the policy (Nugroho, 2018). The internal environment encompasses the readiness of the implementing organization, resources, and the systems used, while the external environment includes the social, economic, and cultural conditions of the community targeted by the policy. In the context of E-Parking implementation in Samarinda City, both internal and external environmental factors play an important role in determining the effectiveness of the policy. Based on the research findings, regarding the internal environment, the Samarinda City Transportation Agency has made efforts to provide systems and supporting equipment for the implementation of E-Parking. However, there are still limitations regarding the availability of supporting facilities, such as Electronic Data Capture (EDC) devices, which are not yet uniformly available at all parking locations. These limitations cause the cashless system to be implemented inconsistently, and parking attendants often return to cash payments as an alternative method.

Furthermore, regarding human resources as part of the internal environment, there are still limitations in the technical capabilities of parking attendants to operate digital systems. This indicates that the organization's internal readiness to support the implementation of technology-based policies is not yet fully optimized. The lack of continuous training and mentoring is also a factor contributing to this situation. From the external environment perspective, societal conditions also significantly influence the effectiveness of E-Parking policies. According to research findings, the public still tends to prefer using cash for transactions, including parking payments. This habit poses a significant barrier to the adoption of cashless systems, as changing public behavior requires time and an adaptation process. Additionally, the uneven level of digital literacy among the public presents a challenge in implementing this policy. Not all members of the public possess adequate understanding or access to cashless payment technologies. Consequently, the E-Parking policy has not yet been fully accepted or implemented optimally across all segments of society.

According to Riant Nugroho, policy effectiveness is strongly influenced by environmental support, both internally and externally. A policy may be well designed, but without a supportive environment, its implementation will not run effectively. Internal readiness in terms of facilities and human resources, as well as external readiness in terms of public acceptance and adaptation, are essential factors in determining policy success. In this study, both internal and external environmental conditions still present significant obstacles to the effectiveness of E-Parking Implementations. This finding is consistent with a study by Pahlevi & Jumansyah (2023), which states that the implementation of non-cash parking management in Samarinda still faces limitations in infrastructure and public adaptation to the digital system. Likewise, (Calcabilla & Dyastari, 2022) found that public habits and weak supporting facilities are major barriers to the successful implementation of E-Parking policies in urban areas.

Therefore, it can be concluded that, based on appropriate environmental indicators, the implementation of the E-Parking policy in Samarinda City still faces various obstacles,

both from internal and external environments. This situation indicates that the success of a policy is not only determined by the policy design itself but also by the readiness of the supporting environment. Therefore, efforts are needed to improve infrastructure availability, strengthen human resources capacity, and increase public readiness so that policy implementation can run more effectively and sustainably.

5. Appropriate Process

Process-related indicators in policy effectiveness theory by Riant Nugroho refer to how the stages of policy implementation are carried out, ranging from the socialization process, implementation, to monitoring and evaluation (Nugroho, 2018). A well-executed process determines the success of a policy, particularly technology-based policies like E-Parking that require adaptation from various stakeholders. In the context of E-Parking implementation in Samarinda City, the implementation process still faces several challenges that affect policy effectiveness. Based on research findings, the E-Parking implementation process in Samarinda City, particularly on KH. Khalid Street has not yet been fully optimized. This is evident from the insufficient public outreach regarding the mechanism for using the E-Parking system. Many parking users do not yet understand how to make cashless payments or the purpose of implementing this policy. This lack of understanding results in low public participation in using the E-Parking system. Effective policy implementation requires strong communication between policy implementers and the target groups, so insufficient socialization becomes a significant obstacle. In the implementation stage, inconsistencies in policy enforcement are still frequently found in the field. Although regulations require the use of cashless systems, some parking attendants continue to accept cash payments from the public. This condition indicates that the implementation process has not fully followed the established regulations, resulting in the policy objectives not being achieved optimally. The persistence of conventional remains weak and requires stronger institutional control.

From the perspective of supervision and monitoring, the research findings indicate that the oversight activities conducted by the Transportation Department have not been carried out optimally or sustainably. The lack of intensity in supervision has led to ongoing violations in the implementation of the policy on the ground. Furthermore, evaluations of policy implementation have not been conducted systematically, resulting in issues arising that are not promptly addressed with appropriate solutions. This suboptimal policy implementation process indicates weaknesses in policy implementation management, particularly regarding coordination, supervision, and evaluation. In technology-based policies, however, the success of implementation is heavily dependent on structured and consistent processes.

According to Riant Nugroho, policy effectiveness is highly dependent on the implementation process, where communication, coordination, supervision, and evaluation must be carried out continuously and consistently. A policy that is well designed will not produce optimal results if the implementation process is weak. In technology-based public service policies, a strong implementation process becomes even more important because it involves behavioral change, technical adaptation, and institutional discipline. In this study, the weakness of the implementation process is one of the main causes of the suboptimal effectiveness of E-Parking. This finding is in line with the study by Putri et al. (2022), which found that weak supervision and low public understanding significantly reduce the effectiveness of E-Parking implementation. Similarly, (Pahlevi & Jumansyah, 2023) stated that

the implementation of non-cash parking policies in Samarinda still faces obstacles in the form of inconsistent enforcement and limited policy monitoring.

Therefore, it can be concluded that, based on the appropriate process indicators, the implementation of the E-Parking policy in Samarinda City has not been optimal. Improvements are needed in public socialization, consistency of enforcement by field officers, and the strengthening of monitoring and evaluation systems to ensure that the policy can be implemented effectively, sustainably, and in accordance with its intended objectives.

6. Barriers to the Effectiveness of Electronic Parking (E-Parking) by the Samarinda City Transportation Agency (Case Study: KH. Khalid Street, Pasar Pagi)

a. Human Resources

Human resources are one of the main barriers to the implementation of E-Parking. Based on the research findings, there are still limitations in the capabilities and understanding of parking attendants regarding the operation of digital systems, such as the use of Electronic Data Capture (EDC) devices. Additionally, the lack of continuous training and guidance has resulted in attendants not yet being fully able to adapt to cashless systems. This situation leads to inconsistencies in policy enforcement on the ground, where attendants still tend to rely on cash payment methods.

b. Public Habits

Public habits also pose a barrier to the implementation of E-Parking. Most people are still accustomed to using cash for transactions, including parking payments. Furthermore, uneven digital literacy means not all parking users understand or have access to cashless payment systems. This results in low public acceptance of E-Parking policies.

c. Lack of Consistency Among Field Staff

Lack of consistency among field personnel is another hindering factor. Although policies mandate the use of cashless systems, in practice, some officers still accept cash payments. This indicates that policy implementation has not been carried out with discipline and in accordance with applicable regulations. This inconsistency is also influenced by a lack of supervision and weak enforcement of rules against field personnel.

d. Lack of Supervision and Monitoring

Suboptimal supervision and monitoring also pose challenges in the implementation of E-Parking. Based on research findings, supervision activities conducted by the Department of Transportation have not been carried out intensively or consistently. This has led to ongoing violations in policy implementation, such as the continued use of cash systems that should have been phased out. Additionally, evaluations of policy implementation have not been conducted systematically, resulting in emerging issues not being addressed effectively and promptly.

Conclusion

Based on the research findings and discussion, it can be concluded that the implementation of the electronic parking (E-Parking) system by the Samarinda City Transportation Agency on KH. Khalid Street, Pasar Pagi, has not been optimal. This is demonstrated through an analysis using the five policy effectiveness indicators proposed by Riant Nugroho: appropriate policy, appropriate implementers, appropriate targets, appropriate environment, and appropriate process. Conceptually, the E-Parking policy is

appropriate as it addresses parking issues and supports the implementation of the smart city concept. However, regarding implementation, limitations remain in the capacity and consistency of field staff. In terms of the target audience, while the policy's objectives align, public acceptance and readiness to use the cashless system remain low. Additionally, from an environmental perspective, both internal and external support remain incomplete, particularly regarding infrastructure limitations and public habits that still rely on cash transactions. Regarding the process, policy implementation has not yet run optimally due to a lack of ongoing outreach, monitoring, and evaluation. Consequently, the effectiveness of E-Parking implementation still needs to be improved through several strategic efforts. First, the Transportation Department needs to enhance human resource capacity through continuous training and development for parking attendants so they can operate the digital system optimally. Second, additional and equitable distribution of supporting facilities, such as Electronic Data Capture (EDC) devices, is needed to support the comprehensive implementation of the cashless system. Third, public outreach must be intensified and sustained to enhance understanding and acceptance of the E-Parking system. Fourth, supervision and monitoring must be conducted more consistently and systematically to ensure policy implementation aligns with regulations. Finally, periodic evaluations are needed as a basis for policy improvements so that E-Parking implementation can operate more effectively and efficiently, thereby supporting the realization of technology-based public services in Samarinda City.

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