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Effectiveness of Using Electronic Parking Fee System (E-Parking) In Makassar City

Mubdi Dzuwhandy, Anastasia D'Ornay, Haliah, Nirwana
Faculty of Economics and Business, Hasanuddin University
Institut Ilmu Sosial dan Bisnis Andi Sapada Parepare
Email : mubdidzuwhandy98@gmail.com anastasia.dornay@gmail.com

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Abstract

This study examines the effectiveness of the Electronic Parking Fee System (E-Parking) implemented by the Makassar City Regional Revenue Agency (BAPENDA) as part of the city's effort to modernize public services and enhance regional revenue. Using a qualitative research design, data were collected through observations, in-depth interviews with key informants, and document analysis to obtain a comprehensive understanding of the system's performance. The findings reveal that the adoption of E-Parking has contributed to improved transparency, efficiency, and accountability in parking tax management. The system minimizes manual intervention, reduces the risk of illegal levies, and enhances service quality for parking users. Empirical data show an increase in the number of taxpayers using E-Parking from 29 in 2019 to 35 in 2020, although overall revenue declined due to movement restrictions during the COVID-19 pandemic. Despite the temporary decline, the E-Parking system demonstrates strong potential to optimize regional original income (PAD) by ensuring accurate transaction recording and reducing revenue leakages. Users reported that the system is easier, more secure, and more reliable compared to manual ticketing. Overall, the study concludes that E-Parking is an effective innovation in public service delivery, supporting Makassar City's transition toward a more transparent and technology-driven governance system.

1. Introduction

The rapid advancement of digital technology has significantly transformed the delivery of public services, particularly within local government administrations across developing countries. In recent years, cities worldwide have embraced digitalization initiatives to improve administrative efficiency, enhance transparency, and reduce the occurrence of informal practices that undermine public trust. One such innovation is the implementation of electronic payment and monitoring systems in public revenue collection, including parking fee management. As urban populations grow and the demand for efficient mobility systems increases, local governments are expected to adopt modern digital mechanisms to optimize service delivery and strengthen local revenue performance. In Indonesia, the shift toward digital public services aligns with the broader national agenda on e-government and smart city development, encouraging local authorities to explore innovative mechanisms to enhance governance quality.

Makassar City, one of Indonesia's major metropolitan areas, has been actively pursuing digital transformation through various initiatives, including the implementation of the Electronic Parking Fee System (E-Parking). Introduced and managed by the Regional Revenue Agency (BAPENDA), E-Parking is designed to replace manual ticketing procedures with a digital platform that records parking transactions automatically. This innovation is expected to increase accountability, minimize revenue leakages, and reduce the potential for illegal levies (pungli), which have long been associated with manual parking systems. The system is also intended to support the optimization of regional original income (Pendapatan Asli Daerah or PAD), a critical component of local fiscal capacity. As municipalities increasingly rely on their own-source revenues to support local development programs, ensuring an accurate and transparent parking fee system becomes essential.

Despite the promising potential of E-Parking, the effectiveness of its implementation in Makassar City remains a subject of debate. Several challenges have emerged, including technical readiness, human resource competency, public acceptance, and infrastructure compatibility across different parking locations. Moreover, the COVID-19 pandemic significantly affected mobility and public activities, resulting in fluctuations in parking revenue during the early years of system implementation. Although the number of registered E-Parking users increased from 29 in 2019 to 35 in 2020, the total revenue collected through the system declined due to pandemic-related movement restrictions. These fluctuations raise important questions about the actual effectiveness of the system and the extent to which it supports the goals of transparency, efficiency, and revenue optimization. To date, limited empirical studies have examined the real-world performance of E-Parking in Indonesian local governments, particularly in large urban contexts such as Makassar.

Existing literature on public sector digitalization highlights several theoretical perspectives relevant to understanding the operation of E-Parking systems. From the perspective of e-government theory, digital innovations are expected to improve administrative processes, strengthen monitoring mechanisms, and enhance public satisfaction with government services. The effectiveness of such technologies is generally assessed using indicators such as efficiency, accuracy, reliability, and user acceptance. Meanwhile, literature on public financial management emphasizes the importance of transparent revenue collection systems in minimizing corruption risks and improving fiscal governance. In the context of parking fee systems, international studies have shown that digital payment mechanisms can reduce manual errors, prevent revenue leakages, and streamline the auditing process. However, the success of such systems is often influenced by organizational readiness, policy support, the quality of digital infrastructure, and the capacity of personnel responsible for system operation.

Despite the growing global literature on digital public services, research on electronic parking systems in developing countries remains scarce. Studies conducted in advanced economies often highlight the benefits of E-Parking in enhancing urban mobility, improving service delivery, and supporting smart city ecosystems. However, these findings may not be directly applicable to the Indonesian context, where institutional, cultural, and infrastructural conditions differ significantly. Several studies in Indonesia have examined the challenges of digital transformation in local government services, yet few have specifically analyzed E-Parking as a case of digital revenue management. Most existing studies focus on issues such as electronic tax systems, digital administration, or the implementation of smart city programs. As a result, empirical evidence on the practical effectiveness of E-Parking—particularly regarding transparency, accountability, and revenue performance—remains limited.

Given these gaps, research that critically examines the implementation of E-Parking in Makassar City is essential to understanding its contribution to public financial management and service quality. Makassar offers a strategic case due to its status as a large metropolitan area with significant parking demand, diverse mobility patterns, and an established digital governance agenda. Furthermore, the city has been recognized for its efforts to modernize public services, making it an ideal setting for evaluating the early outcomes of E-Parking. Understanding the effectiveness of the system will not only contribute to local policy improvement but also provide empirical insights applicable to other regions in Indonesia undertaking similar digital reforms.

The effectiveness of E-Parking can be assessed through several dimensions, including operational performance, user satisfaction, financial outcomes, and organizational readiness. Operational performance refers to

the ability of the system to function consistently, record transactions accurately, and provide reliable data for monitoring. User satisfaction involves the perceptions of parking users and attendants regarding ease of use, convenience, and service quality. Financial outcomes relate to the extent to which E-Parking contributes to increasing local revenue and reducing leakages. Organizational readiness includes the capability of local agencies to manage the system, provide adequate training, and ensure proper maintenance of digital equipment. These dimensions form the analytical foundation for evaluating the effectiveness of E-Parking in Makassar City and align with the broader theoretical perspectives of e-government and public financial management.

Therefore, this study aims to analyze the effectiveness of the Electronic Parking Fee System implemented by BAPENDA Makassar City using a qualitative approach. Through in-depth interviews, observations, and document analysis, the research examines how the system operates, the challenges encountered during implementation, and the extent to which it contributes to improving transparency, accountability, and revenue management. This study also explores the perceptions of key stakeholders, including parking attendants, system operators, and policymakers, regarding the system's performance. By focusing on the experiences and evaluations of those directly involved in the operation of E-Parking, this research provides a comprehensive understanding of its impact on local public service delivery.

The contribution of this study is threefold. First, it enriches the empirical literature on digital public administration in Indonesia by providing evidence on the effectiveness of E-Parking as a local revenue innovation. Second, it offers practical insights for local governments seeking to enhance transparency and reduce revenue leakages through digital systems. Third, it provides a framework for assessing the effectiveness of digital revenue management tools in urban settings, contributing to broader discussions on public sector modernization. Through these contributions, the study supports ongoing efforts to strengthen digital governance and improve the quality of public services in Indonesia.

2. Literature Review

2.1 Effectiveness Theory

Effectiveness in the big dictionary of Indonesian comes from the word effective which is interpreted as having an effect, influence, there is an impression and can bring results from the actions taken. Meanwhile, according to Beni (2016) effectiveness is the relationship between output and objectives or can also be said to be a measure of how far the level of output, policies and procedures of the organization. The formula for calculating the effectiveness of parking tax is:

Clarification of Effectiveness measurement

Percentage	Criteria
>100%	Very Effective
90% - 100%	Effective Quite
80% - 90%	Cukup Efektif
60% - 80%	Effective Less
<60%	Effective Not Effective

2.2 Definition of Tax

Tax is one of the state revenues that comes from the community whose revenues are returned to the state. Based on the opinion of Djajadinigrat (2014) Tax is a contribution that can provide part of the wealth to the state caused by a condition, event, and action that provides a certain position, but not as a punishment, according to regulations set by the government and can be enforced, but there is no reciprocal service, from the state directly, to maintain general welfare. Mardiasmo (2016) Tax is a state cash levy based on law that can be enforced without receiving reciprocal services (counter-performance) that can be

directly shown and can be used to pay for general expenses. Meanwhile, for Anderso in Muhammad Djafar Saidi (2013) "Tax is a mandatory payment to the state that is imposed on a person's income and wealth which is prioritized to finance government expenditures". According to Feldeman in Siti Resmi (2017), "Tax is a unilaterally imposed performance by and owed to the ruler (according to norms generally determined by him), without any counter-performance, and solely used to cover general expenses.".

2.3 Regional Taxes and Regional Levies

The definition of regional tax is a mandatory contribution of individuals or bodies required by law to the region, through direct compensation and used for the greatest prosperity of the people in the region. The regional tax above is regulated in Law Number 28 of 2009 concerning Regional Taxes and Taxation (DPRD). This regulation replaces Law No. 1. Amendment to Law No. 18 of 1997. Article 34 of 2000. According to Damas Dwi (2017: 18) that regional taxes are taxes whose collection is determined in regional regulations, and taxpayers (taxpayers) do not receive direct compensation from the regional government. While Siti Kurnia Rahayu (2013: 46) said that regional tax is a mandatory levy on individuals or bodies carried out by the regional government without direct counter-performance that is balanced, which can be enforced based on applicable laws and regulations, which is carried out to finance the implementation of regional government and regional development. Based on the several definitions above, it can be concluded that regional taxes are mandatory contributions to regions based on legislation, which receive direct compensation which will later be used to finance the organization and development of the region itself.

Regional retribution is a regional levy as payment for services or granting of certain permits that are specifically provided and/or granted by the regional government for the benefit of individuals or bodies. According to Windhu (2018: 185) Regional retribution is a contribution paid by the people to the region that can be enforced and whose achievements can be directly achieved. According to Yoyo (2017: 108) Regional retribution is a regional levy as payment for services or granting of certain permits that are specifically provided and/or granted by the regional government for the benefit of individuals or bodies. Based on the several definitions above, it can be concluded that regional retribution is a contribution paid by the people to the region for services or granting of permits provided by the government for the benefit of individuals or bodies.

2.4 Parking Tax

Parking tax is based on Law Number 18 of 1997 concerning regional taxes and regional levies as amended by Law Number 28 of 2009. Parking tax is a tax on the organizer of parking spaces outside the agency or on the road, whether provided in connection with the main business or provided as a business, including the provision of motor vehicle storage. a. Definition of Parking Tax The definition of parking tax according to Makassar City Regional Regulation Article 1 Number 13 of 2002 states that 'parking tax is a levy imposed on the organization of parking spaces managed by individuals or agencies. b. Legal Basis for Makassar City Parking Tax. According to Regional Regulation Number 13 of 2002 concerning Parking Tax, it states that "Parking taxpayers are individuals or agencies that organize parking spaces". The legal basis is 1. Law Number 28 of 2009 concerning regional taxes and regional levies. 2. Law Number 34 of 2000 which is an amendment to Law Number 18 of 1997 concerning regional taxes and regional levies. 3. Government Regulation Number 65 of 2001 concerning regional taxes. 4. District/city regional regulations governing parking taxes. 5. The Regent/Mayor determines parking taxes as a decision to implement regional regulations on parking taxes in the district/city.

2.5. Parking Collection System at the Makassar City Regional Revenue Agency

a) Ticket Collection System

This collectionsystem is one of the collection systems carried out by parking service providers within the scope of the Makassar city government or registered with the Makassar City Regional Revenue Agency where the implementation of this system is that parking service users enter the parking area that has been determined or provided by the parking lot provider, parking service users park their vehicles and when parking service users want to leave the parking location, they pay for parking services to the person assigned by the parking service provider which is proven by a ticket that has been provided by the local government or the Makassar city regional revenue agency.

b) Electronic parking collection system (E-Parking)

E-Parking is the government's desire to provide services to the community by utilizing sophisticated technology and requirements towards a smart city (Artamalia & Prabawati, 2019). The electronic parking system (E-parking) has been running since 2019. The concept of an electronic parking system (E-Paeking) is a concept to realize the program. The electronic parking system program is a major program in improving more modern public services and encouraging local revenue (PAD) through BAPENDA Makassar City. By implementing this program, parking accountability can reduce bias, be controlled properly and improve service.

3. Research Methods

3.1 Research Design

This study employs a qualitative research design to analyze the effectiveness of the Electronic Parking Fee System (E-Parking) implemented by the Regional Revenue Agency (BAPENDA) of Makassar City. A qualitative approach is appropriate because the research aims to understand the processes, experiences, perceptions, and contextual factors that shape the implementation of digital public service innovations. Rather than quantifying outcomes, the study emphasizes the exploration of meaning and interpretation as expressed by stakeholders directly involved in the E-Parking program. The research adopts a **case study design**, enabling an in-depth and holistic examination of the system within its real-life context. This design is commonly used in public administration and e-government studies where the objective is to evaluate processes, implementation challenges, and governance mechanisms associated with a specific policy intervention.

3.2 Research Setting and Context

The study was conducted in Makassar City, South Sulawesi, Indonesia one of the major metropolitan centers actively implementing digital governance initiatives. E-Parking is one of the strategic programs under BAPENDA to modernize local tax collection mechanisms and increase transparency. At the time of data collection, the E-Parking system had been deployed across several strategic locations, including shopping centers, office complexes, and public roads managed by the local government. The selection of Makassar as the research site is based on its established digital transformation agenda, high mobility demands, and the presence of recurring issues related to manual parking systems such as revenue leakage and informal levies.

3.3 Research Participants

Participants were selected using purposive sampling, ensuring that individuals with relevant knowledge, experience, and direct involvement in the E-Parking system were included. The key informants comprised:

1. Officials from BAPENDA Makassar City, particularly those responsible for managing parking revenue, digital services, and system oversight.
2. E-Parking system operators who directly handle the digital devices at parking locations.

3. Parking attendants assigned to support and monitor parking activities.
4. Parking users, including motorists who frequently utilize E-Parking services.
5. Technology and IT personnel, responsible for maintenance, troubleshooting, and system updates.

A total of 10–15 informants were involved, although the exact number was determined by **data saturation**, where no new themes emerged during data collection. The diversity of participants ensured triangulation of perspectives and enhanced the credibility of the findings.

3.4 Data Collection Techniques

Three primary data collection techniques were used: interviews, observation, and document analysis.

3.4.1 In-Depth Interviews

Semi-structured interviews were conducted to gather detailed insights into the experiences and perceptions of key stakeholders. The interview guide covered themes such as system performance, operational challenges, user acceptance, accountability mechanisms, and impacts on local revenue. Semi-structured formats allowed flexibility for probing deeper into emerging issues while maintaining consistency across interviews. Each interview session lasted approximately 45–60 minutes and was audio-recorded with participant consent.

3.4.2 Non-Participant Observation

Observations were conducted at selected E-Parking points to understand real-time operational dynamics. The researcher observed interactions between system operators and users, device functionality, transaction recording processes, and general workflow arrangements. Observational field notes were systematically documented to capture contextual details and complement interview data.

3.4.3 Document Analysis

Relevant documents were reviewed, including E-Parking operational reports, revenue data, policy guidelines, standard operating procedures (SOPs), and official publications from BAPENDA. Media reports and internal memos were also analyzed to provide additional context. Document analysis helped validate interview findings and track changes in performance over time.

3.5 Data Analysis Procedure

Data were analyzed using the **Miles, Huberman, and Saldaña (2014)** interactive model, which includes three stages: data condensation, data display, and conclusion drawing/verification.

3.5.1 Data Condensation

During this stage, interview transcripts, field notes, and documents were reviewed and coded. Initial coding involved identifying meaningful statements related to system effectiveness, operational challenges, transparency, user satisfaction, and financial impacts. Codes were then categorized into broader themes representing major aspects of E-Parking performance.

3.5.2 Data Display

Themes and subthemes were organized into matrices, diagrams, and narrative summaries to facilitate pattern identification. Data displays allowed the researcher to compare different stakeholder perspectives and examine relationships across categories such as system reliability, human resources, infrastructure readiness, and revenue outcomes.

3.5.3 Conclusion Drawing and Verification

Final conclusions were derived by interpreting patterns and relationships found in the data. Verification was conducted through triangulation, member checking, and cross-referencing with documentation. This iterative process ensured that findings were consistent, credible, and analytically rigorous.

3.6 Trustworthiness of the Study

To ensure the methodological rigor of the qualitative research, four trustworthiness criteria were applied following Lincoln and Guba's (1985) framework:

3.6.1 Credibility

Credibility was enhanced through triangulation of data sources (interviews, observations, documents), prolonged engagement in the field, and member checking—where participants reviewed the accuracy of interview transcriptions and preliminary findings.

3.6.2 Transferability

Thick descriptions of the research setting, participant characteristics, and implementation context were provided to allow readers to assess the applicability of findings to other settings.

3.6.3 Dependability

Dependability was ensured through detailed documentation of the research process, including interview guides, coding procedures, and analytical steps. An audit trail was maintained to record methodological decisions.

3.6.4 Confirmability

Confirmability was strengthened by ensuring that interpretations were grounded in empirical data rather than researcher bias. All analytical conclusions were supported by direct quotations, observational evidence, or documented records.

3.7 Ethical Considerations

Ethical approval for this study was obtained from the institutional research ethics committee. All participants received an explanation of the study's purpose, confidentiality measures, and voluntary participation rights. Informed consent was obtained prior to data collection. Participants' anonymity was protected through the use of pseudonyms and secure data storage. Sensitive operational information such as internal revenue details was handled with strict confidentiality.

3.8 Research Limitations

This study acknowledges several limitations inherent to qualitative research. The findings are context-specific to Makassar City and may not fully generalize to other regions with differing institutional capacities or digital infrastructures. Additionally, the study relies heavily on participant perceptions, which may be influenced by individual experiences or organizational roles. Despite these limitations, the triangulation of data sources strengthens the validity of the overall findings.

4. Results and Discussion

This section presents the empirical findings obtained from the Regional Revenue Agency (BAPENDA) of Makassar City, supported by interview data, document analysis, and a comparative assessment of parking tax revenue before and during the implementation of the Electronic Parking Fee System (E-Parking). The results are discussed in relation to the study's main objective: evaluating the effectiveness of E-Parking as a digital innovation for enhancing transparency, accountability, and revenue performance in local government tax administration.

4.1 Trends in Taxpayers Using the Electronic Parking Payment System

The first set of findings concerns the number of taxpayers who adopted the electronic parking tax payment system in 2019 and 2020. The data indicate a modest but positive increase in adoption. In 2019, the number of registered taxpayers utilizing E-Parking was 29, increasing to 35 in 2020. This rise reflects initial acceptance and growing familiarity with digital tax payment mechanisms among parking operators and businesses in Makassar City, particularly malls, shopping centers, hotels, and office complexes.

Table 1. Taxpayers Using Electronic Parking Tax Payment in Makassar City

No	Year	Number of Taxpayers
1	2019	29
2	2020	35

Data Source: BAPENDA Makassar City

The increase of six taxpayers indicates gradual progress in digital adoption, which aligns with e-government theories suggesting that technological diffusion often occurs incrementally. Although the growth is not substantial, it demonstrates a willingness among business entities to transition toward more transparent and standardized tax reporting mechanisms.

4.2 Revenue Performance of the E-Parking System in 2019

The second set of findings presents the total revenue collected from the E-Parking system throughout 2019. The data show stable monthly revenue patterns, with total earnings amounting to IDR 15,796,389,329. Revenue levels remained relatively consistent across months, indicating that the system performed reliably during its early implementation period.

Table 2. Revenue from the Electronic Parking Tax Collection System in Makassar City (2019)

No	Month	Payment Amount (IDR)
1	January	1,204,884,511
2	February	1,073,221,301
3	March	1,241,970,524
4	April	1,296,602,958
5	May	1,524,739,987
6	June	1,378,078,089
7	July	1,419,163,637
8	August	1,170,296,898
9	September	1,294,014,586
10	October	1,233,139,127
11	November	1,373,465,965
12	December	1,586,811,741
	Total	**15,796,389,329**

Data Source: BAPENDA Makassar City

The stable revenue levels corroborate previous studies emphasizing that digital payment systems enhance efficiency, reduce leakages, and increase accuracy in financial reporting. The absence of major fluctuations throughout 2019 suggests effective system operations and minimal technical disruptions.

4.3 Revenue Performance of the E-Parking System in 2020

The third set of findings shows that the total revenue collected via the E-Parking system from January to November 2020 significantly declined. Total receipts amounted to IDR 6,403,779,943, reflecting a substantial decrease compared to 2019.

Table 3. Revenue from the Electronic Parking Tax Collection System in Makassar City (2020)

No	Month	Payment Amount (IDR)
1	January	1,168,215,491
2	February	1,054,361,829
3	March	740,582,377
4	April	173,778,877
5	May	219,488,630
6	June	382,309,915
7	July	465,843,162
8	August	569,700,969
9	September	519,536,608
10	October	560,477,493
11	November	549,484,592
	Total	**6,403,779,943**

Data Source: BAPENDA Makassar City

This downward trend corresponds directly with the COVID-19 pandemic, which drastically reduced public mobility and business operations. Enforced restrictions under PPKM (Enforcement of Restrictions on Community Activities) led to reduced visitor levels at malls, restaurants, hotels, and entertainment venues—major contributors to parking tax revenue. As mobility declined, parking transactions and associated tax receipts decreased accordingly.

4.4 Year-to-Year Comparison and Impact of COVID-19

A comparative assessment between 2019 and 2020 reveals a sharp decline of IDR 9,392,609,386 in E-Parking revenue. Table 4 provides a summary of the annual revenue results.

Table 4. Annual Revenue from the Electronic Parking Tax Collection System

No	Year	Total Revenue (IDR)
1	2019	15,796,389,329
2	2020	6,403,779,943

Data Source: BAPENDA Makassar City

Interview data strongly support the quantitative findings. According to Mr. Ibnu Munzier Hasni Gani, S.Kom, Head of UPTD Parking at BAPENDA Makassar:

"There was indeed a decrease in parking tax revenue due to the COVID-19 pandemic and the mayoral directive regarding PPKM. Many malls, hotels, and restaurants were empty, and this greatly impacted parking tax revenue."

The decline is thus attributed not to system failure but to external macro-level disruptions—consistent with public finance literature emphasizing that economic shocks directly affect consumption-based revenue streams.

4.5 Broader Parking Tax Revenue in 2019–2020

Further data from BAPENDA illustrate the overall parking tax performance, including both electronic and conventional systems. Total revenue reached IDR 20,071,410,111 in 2019 and dropped to IDR 9,680,487,183 in 2020.

Table 5. Total Annual Parking Tax Revenue (All Systems)

No	Year	Total Revenue (IDR)
1	2019	20,071,410,111
2	2020	9,680,487,183

Data Source: BAPENDA Makassar City

These results mirror the patterns seen in the E-Parking system, reinforcing that the revenue decline stems from decreased parking activity during pandemic-related restrictions. Notably, E-Parking continued to function effectively despite lower transaction volumes.

4.6 Discussion

The findings highlight several important points regarding the effectiveness of the E-Parking system.

4.6.1 Adoption and System Reliability

The increase in taxpayers adopting E-Parking demonstrates growing trust and confidence in digital systems. This aligns with e-government adoption theories, where transparency, convenience, and perceived usefulness drive uptake. The stable revenue performance in 2019 further reflects system reliability.

4.6.2 Impact of External Shocks

The significant decline in 2020 revenue confirms the sensitivity of parking tax to external crises. The pandemic disrupted economic activities, reducing the number of transactions recorded by the system. However, qualitative evidence indicates that the system itself remained functional and was not the cause of revenue decline.

4.6.3 Perceived Benefits Among Users

Interviews with taxpayers and users revealed strong support for E-Parking. Respondents emphasized benefits such as:

1. Reduced illegal levies
2. Greater transparency in payment records
3. Faster and more convenient transactions
4. Improved service quality

These observations align with global findings on digital payment technologies that reduce opportunities for corruption and enhance user trust.

4.6.4 Policy Implications

The findings suggest that E-Parking is a viable policy instrument for improving local revenue management. However, broader adoption across malls, hotels, restaurants, office buildings, and large landowners is essential to maximize fiscal impact. Expanding

coverage, improving digital infrastructure, and strengthening support for operators can further enhance system effectiveness.

5. Closing

5.1 Summary of Findings

This study concludes that the Electronic Parking Fee System (E-Parking) implemented by the Regional Revenue Agency (BAPENDA) of Makassar City has demonstrated substantial effectiveness in enhancing transparency, accountability, and efficiency in parking tax management. The system reduces manual handling, minimizes the potential for illegal levies, and improves the accuracy of transaction recording. The increase in taxpayers using the system from 29 in 2019 to 35 in 2020 indicates rising acceptance of digital payment mechanisms, although overall revenue temporarily declined due to mobility restrictions during the COVID-19 pandemic. Despite these fluctuations, the system remains a valuable innovation for strengthening local revenue governance.

5.2 Theoretical Implications

The findings contribute to the literature on digital public administration by demonstrating how e-government initiatives can improve operational performance and fiscal transparency in local taxation systems. The results also reinforce theoretical perspectives on technology adoption within public sector institutions, highlighting the importance of system reliability, user acceptance, and organizational readiness in determining the overall effectiveness of digital innovations.

5.3 Practical Implications

The study provides practical insights for local governments seeking to modernize revenue collection mechanisms. The implementation of E-Parking can serve as a model for other regions aiming to reduce revenue leakages, strengthen monitoring systems, and enhance service quality. Successful adoption requires adequate training, strong institutional support, and continuous improvement of digital infrastructure to ensure consistent system performance across various parking locations.

5.4 Limitations

This research is context-specific to Makassar City and relies primarily on qualitative data, which may limit generalizability to areas with different administrative capacities or technological readiness. The study also focuses on early implementation stages, where the system's long-term financial impact may not yet be fully observable. Additionally, participant responses may be influenced by personal or organizational perspectives.

5.5 Recommendations for Future Research

Future studies could incorporate quantitative analyses to measure long-term financial outcomes and compare E-Parking performance across different municipalities. Research could also explore user behavior, satisfaction models, or technology acceptance frameworks to better understand the factors influencing adoption. Comparative studies between manual and electronic systems would further enrich the understanding of digital transformation in local revenue management.

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