

Parking Digitalization and Local Own-Source Revenue Optimization in Pekanbaru: Evidence from Regional Budget Realization Reports, 2023-2025

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Abstract

This study examines whether parking digitalization can be positioned as a credible instrument for public service modernization and local own-source revenue (PAD) optimization in Pekanbaru City. Although e-parking is often promoted as a mechanism to reduce revenue leakage and increase transaction transparency, empirical evidence based on budget realization data remains limited. Using a quantitative descriptive design, this study analyzes Regional Budget Realization Reports for all regencies and cities in Riau Province over 2023-2025. Parking receipts are measured as the aggregate of parking tax, on-street parking service retribution, and special parking facility retribution. The results reveal a fiscal divergence: Pekanbaru's PAD increased from IDR 890.31 billion in 2023 to IDR 1,276.15 billion in 2025, whereas identified parking receipts declined from IDR 20.64 billion to IDR 7.48 billion over the same period. Consequently, the parking-to-PAD ratio fell from 2.32% to 0.59%. Pekanbaru remained the second-largest contributor to parking receipts among Riau regencies/cities, but its regional share decreased from 38.18% to 15.88%. The findings suggest that digitalization should not be treated as a stand-alone payment innovation; rather, it must be embedded in integrated fiscal governance, transaction reconciliation, object registration, risk-based supervision, and performance monitoring. This article contributes by connecting digital government theory, public value, and smart city governance with granular fiscal evidence on local parking revenue management.

Keywords: Parking Digitalization, Local Own-Source Revenue, E-Parking, Public Value

Jel Codes: M11; M38; M42

1. Introduction

Local governments are increasingly required to modernize public services while simultaneously strengthening their fiscal capacity. In Indonesian cities, parking services occupy a strategic policy intersection: they are highly visible to citizens, operationally vulnerable to cash-based leakage, and fiscally connected to local tax and retribution accounts. This makes parking a useful lens for examining whether digital public service innovation can generate both service quality improvements and measurable revenue governance outcomes.

The policy context in Pekanbaru is particularly relevant. As one of the largest urban economies in Riau Province, Pekanbaru faces persistent pressure to improve public service reliability and

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expand local own-source revenue (Pendapatan Asli Daerah/PAD). Regional Regulation of Pekanbaru City Number 1 of 2024 on Local Taxes and Local Retributions provides a renewed legal basis for strengthening the administration of local revenue objects, including parking-related revenue. At the national level, Law Number 1 of 2022 reshapes the fiscal relationship between central and local governments by strengthening local taxing authority and reorganizing local taxes and retributions, while Presidential Regulation Number 95 of 2018 encourages electronic-based government systems.

Digital parking systems are commonly expected to address three governance problems. First, non-cash payment and electronic ticketing create a traceable record of transactions. Second, data dashboards can improve operational monitoring of parking points, attendants, and revenue flows. Third, integration between service platforms and fiscal recording can reduce information asymmetry between field collection, bank deposits, and budget realization. However, international and Indonesian experiences indicate that technology alone does not guarantee stronger public revenue. Digital transformation requires redesigning processes, organizations, supervision routines, data governance, and citizen-facing services ([Gil-Garcia et al., 2018](#); [Mergel et al., 2019](#); [Twizeyimana & Andersson, 2019](#)).

Existing studies on e-parking in Indonesia have generally emphasized implementation processes, transparency, user acceptance, and operational constraints. Studies of Semarang and Samarinda, for example, indicate that e-parking can improve transparency and reduce discretionary practices, but implementation is constrained by infrastructure readiness, user habits, and enforcement consistency ([Alzena et al., 2024](#); [Perdana & Utomo, 2024](#)). In contrast, fewer studies examine parking digitalization using multi-year budgetary evidence and inter-regional benchmarking. This creates a research gap between the governance narrative of digitalization and its observable fiscal expression in local financial data.

Accordingly, this study asks: how did Pekanbaru's parking-related revenue perform during 2023-2025, how large was its contribution to PAD, and how did Pekanbaru's position compare with other regencies and cities in Riau Province? The study aims to (1) analyze the trend of PAD and parking receipts in Pekanbaru, (2) identify the structure of parking-related revenue accounts, (3) compare Pekanbaru's performance with other local governments in Riau, and (4) formulate governance implications for parking digitalization as a fiscally accountable public service reform.

2. Literature Review

2.1 Digital Public Service Transformation

Digital transformation in the public sector refers to more than adopting applications or electronic payment channels. Mergel et al. (2019) define it as a comprehensive transformation of processes, services, and organizational arrangements through digital technologies. Similarly, [Gil-Garcia et al. \(2018\)](#) locate digital government at the crossroads of public administration, information systems, and public management, implying that digital initiatives should be judged not only by technological deployment but also by how they change managerial capacity, accountability, and service outcomes.

The public value perspective provides a useful evaluative foundation. [Twizeyimana and Andersson \(2019\)](#) show that e-government value includes administrative efficiency, improved public services, transparency, accountability, trust, and citizen participation. For parking services, public value may therefore include faster payment, clearer tariffs, fewer disputes,

improved service predictability, and more auditable revenue flows. These outputs are central to good governance because they connect operational data with public accountability.

2.2 Smart Parking and Smart City Governance

Smart parking is typically discussed as part of urban mobility and smart city systems. It can involve electronic payments, sensors, mobile applications, point-of-sale devices, automated gates, dashboard analytics, and geospatial information ([Barriga et al., 2019](#); [Fahim et al., 2021](#)). Nevertheless, smart parking is not merely a technical architecture. It is a socio-technical system whose performance depends on user behavior, legal authority, tariff design, object registration, service standards, enforcement mechanisms, and institutional coordination.

Smart city governance research warns that technological systems in developing countries require complementary reforms in regulation, administrative capacity, financing, and digital inclusion ([Tan & Taeihagh, 2020](#)). [Meijer and Rodriguez Bolivar \(2016\)](#) also argue that smart urban governance must combine smart administration, decision-making, collaboration, and citizen-oriented outcomes. These insights are important for Pekanbaru because parking digitalization can succeed only when service platforms are connected to local revenue administration, treasury deposit processes, and performance monitoring.

2.3 Parking Revenue, Local Fiscal Governance, and Digital Tax Administration

Parking-related revenue in Indonesia may appear as local tax or local retribution, depending on the object and the mode of service provision. Parking tax is generally associated with private or business-based parking operations, while parking retribution relates to government-provided parking services such as on-street parking or special parking facilities. This distinction matters because each account requires different policy instruments: tax administration depends on taxpayer registration, reporting, audit, and compliance control; retribution administration depends more directly on service delivery, tariff enforcement, point-of-service collection, and remittance reconciliation.

Recent digital tax administration literature shows that digital tools can reduce information asymmetry and strengthen tax supervision, but the fiscal effect depends on institutional design and compliance behavior ([Cheng et al., 2024](#); [He & Yi, 2023](#)). In the parking context, digitalization should therefore be evaluated through the extent to which transaction data are integrated into revenue administration, not simply through the existence of QR-based payment or an application. The conceptual framework of this study positions parking digitalization as a governance mechanism that can affect PAD through transparency, efficiency, accountability, and data-driven enforcement.

3. Research Method

3.1 Research Design

This study employs a quantitative descriptive design using multi-year trend analysis. The design is appropriate because the available data are aggregate annual budget realization data, not micro-level transaction logs or monthly panel observations. The analysis therefore does not claim to identify the causal effect of parking digitalization. Instead, it maps fiscal patterns, account structures, and regional benchmarks that can inform the design of a more accountable parking digitalization policy.

3.2 Data, Unit of Analysis, and Variables

The main data source is the Regional Budget Realization Report (Laporan Realisasi

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Anggaran/LRA) dataset for local governments in Riau Province for fiscal years 2023, 2024, and 2025. The primary unit of analysis is Pekanbaru City. The 12 regencies/cities in Riau Province are used as a comparative benchmark. The parking revenue variable is constructed from three accounts: Parking Tax, On-Street Parking Service Retribution, and Special Parking Facility Retribution.

Table 1. Operational definition of research indicators

Indicator	Operational definition	Measurement
Local own-source revenue (PAD)	Total locally generated revenue recognized in the regional budget realization report.	Local taxes + local retributions + revenue from separated regional wealth + other legitimate PAD.
Parking receipts	Budget realization associated with parking-related revenue accounts.	Parking tax + on-street parking service retribution + special parking facility retribution.
Parking-to-PAD ratio	Relative fiscal contribution of parking receipts to PAD.	$\text{Parking receipts} / \text{PAD} \times 100\%$.
Annual growth	Year-on-year change in a fiscal indicator.	$(\text{Value}_t - \text{Value}_{t-1}) / \text{Value}_{t-1} \times 100\%$.
Regional share	Pekanbaru's contribution to parking receipts among regencies/cities in Riau.	$\text{Pekanbaru parking receipts} / \text{aggregate parking receipts of Riau regencies/cities} \times 100\%$.

Source: Compiled by the authors based on the LRA dataset and Indonesian local fiscal revenue classifications.

3.3 Data Processing Technique

Data processing was conducted in four stages. First, relevant revenue account rows were identified consistently across the 2023, 2024, and 2025 worksheets. Second, PAD was reconstructed as the sum of local tax revenue, local retribution revenue, revenue from separated regional wealth, and other legitimate PAD. Third, parking receipts were aggregated from the three parking-related accounts. Fourth, the study calculated parking-to-PAD ratios, annual growth rates, regional shares, and inter-regional rankings. Empty cells in revenue accounts were treated as zero where no realization was reported.

4. Findings and Discussions

4.1 Divergence between PAD Growth and Parking Revenue Performance

The first empirical finding is a clear divergence between Pekanbaru's overall PAD and its identified parking receipts. PAD increased from IDR 890.31 billion in 2023 to IDR 923.12 billion in 2024 and IDR 1,276.15 billion in 2025. This represents cumulative growth of 43.34% between 2023 and 2025. In contrast, parking receipts declined from IDR 20.64 billion in 2023 to IDR 9.05 billion in 2024 and IDR 7.48 billion in 2025, equivalent to a cumulative decline of 63.73%.

This trend has important implications. If digitalization is expected to reduce leakage and improve fiscal capture, the observed decline suggests that the policy problem is not only technological. It may involve weaknesses in object registration, collection coverage, taxpayer compliance, classification consistency, transaction-to-LRA reconciliation, or the governance of parking operations. From a digital government perspective, the evidence supports [Mergel et al.'s \(2019\)](#) argument that transformation must involve organizational and process redesign, rather than a simple migration from cash to electronic payments.

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Table 2. Pekanbaru PAD and parking revenue indicators, 2023-2025

Year	PAD (IDR billion)	Parking receipts (IDR billion)	Parking/PAD (%)	Parking growth (%)	Riau rank	Regional share (%)
2023	890.31	20.64	2.32	-	2	38.18
2024	923.12	9.05	0.98	-56.12	2	20.22
2025	1,276.15	7.48	0.59	-17.34	2	15.88

Source: LRA of Riau local governments, 2023-2025; authors' calculations.

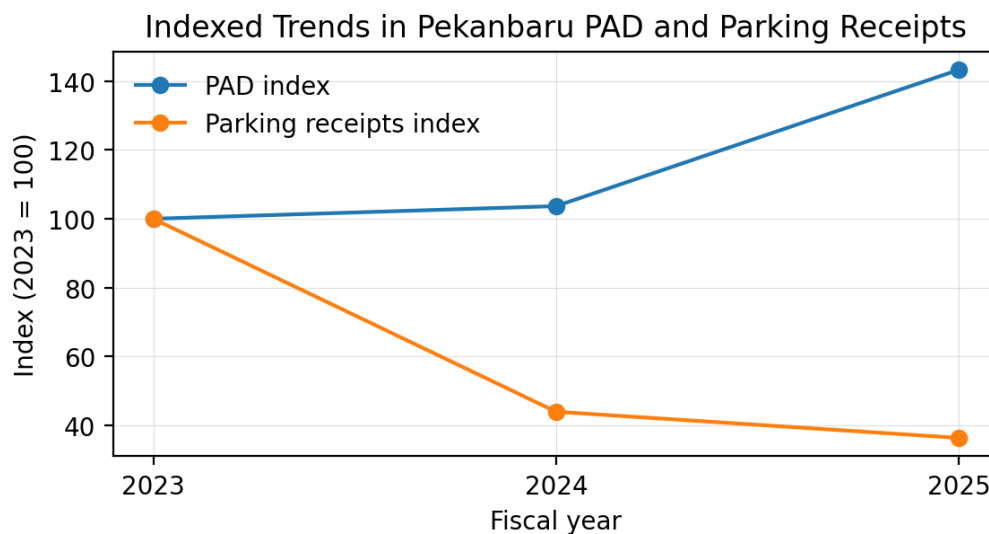


Figure 1. Indexed trends in Pekanbaru PAD and parking receipts, 2023-2025

Source: LRA of Riau local governments, 2023-2025; authors' calculations.

The parking-to-PAD ratio confirms the weakening fiscal contribution of parking. The ratio fell from 2.32% in 2023 to 0.98% in 2024 and 0.59% in 2025. Although parking is not the dominant source of Pekanbaru's PAD, a declining contribution from such a visible urban service signals a need for targeted governance reform. Under the public value perspective, the importance of parking digitalization should therefore be judged not only by the nominal amount collected, but also by its ability to improve fairness, traceability, tariff certainty, and public trust.

4.2 Revenue Structure: Dominance of Parking Tax and the Absence of On-Street Parking Retribution

The second finding concerns the internal structure of parking receipts. Pekanbaru's parking revenue was almost entirely derived from the Parking Tax. In 2025, Parking Tax contributed IDR 7.45 billion, or 99.48% of all identified parking receipts. Special Parking Facility Retribution contributed only IDR 39.00 million, whereas On-Street Parking Service Retribution recorded no realization over 2023-2025. This structure is analytically important because it indicates that parking digitalization in Pekanbaru should not be designed solely as a street-level payment project. A major part of the potential intervention lies in monitoring tax compliance for parking businesses and in integrating business transaction data with the local revenue agency.

Table 3. Composition of Pekanbaru parking receipts by account, 2023-2025

Account	2023 (IDR billion)	2024 (IDR billion)	2025 (IDR billion)	2025 share (%)
Parking tax	20.64	9.02	7.45	99.48
On-street parking service retribution	0.00	0.00	0.00	0.00
Special parking facility retribution	0.00	0.03	0.04	0.52
Total parking receipts	20.64	9.05	7.48	100.00

Source: LRA of Riau local governments, 2023-2025; authors' calculations.

The zero realization of On-Street Parking Service Retribution should be interpreted cautiously. It does not necessarily prove that on-street parking services do not exist; rather, it may reflect classification issues, the absence of recognized realization under the account, or the need for a stronger reconciliation between field operations and accounting records. This finding is consistent with the good governance argument that transparency must reach the accounting chain, not merely the payment interface. A digital ticket or QR code has limited fiscal value if transaction records are not reconciled with deposits and budget realization accounts.

4.3 Regional Benchmarking within Riau Province

The third finding is obtained from benchmarking Pekanbaru against other regencies and cities in Riau Province. Pekanbaru consistently ranked second in total parking receipts over 2023-2025. However, its regional share declined sharply from 38.18% in 2023 to 20.22% in 2024 and 15.88% in 2025. In 2025, Kota Dumai became the dominant contributor, accounting for 63.85% of all parking receipts among Riau regencies/cities. This pattern indicates that Pekanbaru's economic scale as an urban center was not fully reflected in its parking revenue performance.

Table 4. Top five regencies/cities by parking receipts in Riau, 2025

Rank	Regency/city	Parking receipts (IDR billion)	Share of Riau regencies/cities (%)
1	Kota Dumai	30.09	63.85
2	Kota Pekanbaru	7.48	15.88
3	Kab. Siak	2.20	4.67
4	Kab. Rokan Hulu	1.33	2.82
5	Kab. Bengkalis	1.29	2.73

Source: LRA of Riau local governments, 2023-2025; authors' calculations.

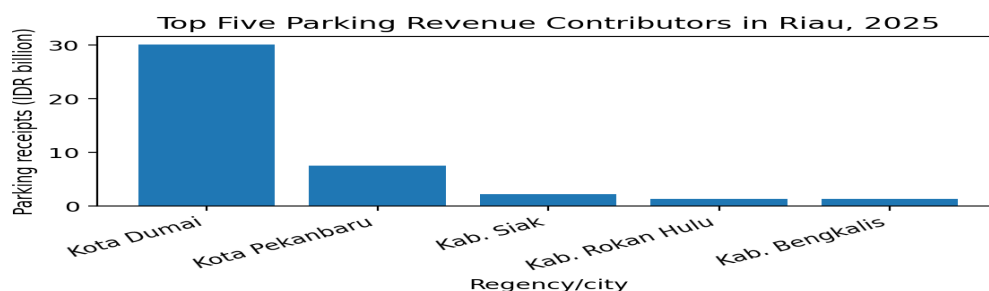


Figure 2. Top five parking revenue contributors in Riau, 2025

Source: LRA of Riau local governments, 2023-2025; authors' calculations.

Regional benchmarking strengthens the policy relevance of the study. If a city with greater traffic intensity and urban economic activity records a falling share of regional parking receipts, the issue should be investigated through data governance and administrative diagnostics. Smart city governance literature emphasizes that technology-enabled urban services must be accompanied by institutional coordination, regulatory clarity, financing, and performance control (Meijer & Rodriguez Bolivar, 2016; Tan & Taeihagh, 2020). Thus, Pekanbaru needs to transform parking digitalization into an integrated fiscal governance system.

4.4 Regional Account Composition and Policy Interpretation

At the aggregate level of Riau regencies/cities, total parking receipts declined from IDR 54.05 billion in 2023 to IDR 44.78 billion in 2024, before increasing slightly to IDR 47.12 billion in 2025. However, account composition changed substantially. The share of Parking Tax in regional parking receipts fell from 44.95% in 2023 to 21.15% in 2025, while Special Parking Facility Retribution increased from 43.93% to 63.07%. Pekanbaru displayed a different pattern: it remained the principal contributor to the regional Parking Tax account, contributing 74.71% of Riau's parking tax in 2025, but had minimal contribution to parking retribution accounts.

Table 5. Regional parking account composition and Pekanbaru tax share, 2023-2025

Year	Total regional parking receipts (IDR billion)	Parking tax share (%)	On-street retribution share (%)	Special facility retribution share (%)	Pekanbaru share of regional parking tax (%)
2023	54.05	44.95	11.12	43.93	84.94
2024	44.78	26.45	13.67	59.87	76.16
2025	47.12	21.15	15.77	63.07	74.71

Source: [LRA of Riau local governments](#), 2023-2025; authors' calculations.

This finding refines the policy target. A uniform e-parking policy may be ineffective if it does not distinguish between tax-based and retribution-based parking revenue. For tax-dominant parking structures, the priority should be digital reporting, taxpayer profiling, transaction monitoring, risk-based audit, and data exchange between parking operators and the local revenue agency. For retribution-based structures, the priority should be digital point-of-service collection, tariff enforcement, attendant accountability, and deposit reconciliation. This distinction is aligned with digital tax administration research showing that the benefits of digitalization depend on how information systems change compliance incentives and administrative capability (Cheng et al., 2024; He & Yi, 2023).

4.5 Theoretical Contribution and Practical Implications

The study contributes to digital government and public finance literature in three ways. First, it demonstrates that digital service modernization should be evaluated through fiscal accountability evidence, not merely implementation narratives. Second, it links smart parking with PAD optimization by showing how parking revenue accounts can reveal governance gaps. Third, it offers a distinction between payment digitalization and revenue administration digitalization. The latter is more demanding because it requires consistent object registration, transaction capture, bank deposit matching, fiscal reporting, and managerial dashboards.

For Pekanbaru, the practical implication is that parking digitalization should be redesigned as an integrated data governance reform. The city government needs a single parking database

covering official parking points, operators, parking attendants, rates, payment channels, tax/retribution account mapping, device status, transaction records, and deposit records. The local revenue agency and transportation agency should conduct routine reconciliation between digital transaction logs, bank/RKUD deposits, operator reports, attendant reports, and LRA accounts. Without this integration, digitalization may improve the appearance of service modernization while failing to secure fiscal accountability.

5. Conclusion

This study concludes that Pekanbaru experienced a fiscal divergence during 2023-2025. PAD increased by 43.34%, from IDR 890.31 billion to IDR 1,276.15 billion, while identified parking receipts declined by 63.73%, from IDR 20.64 billion to IDR 7.48 billion. The contribution of parking receipts to PAD declined from 2.32% to 0.59%. The internal structure of parking revenue was dominated by Parking Tax, which accounted for 99.48% of parking receipts in 2025, while On-Street Parking Service Retribution recorded no realization across the period.

The findings imply that parking digitalization remains relevant, but it must be framed as fiscal governance reform rather than a narrow cashless payment initiative. For Pekanbaru, priority actions include developing a unified parking database, strengthening taxpayer and object registration, integrating transaction data with revenue administration, reconciling digital logs with RKUD deposits and LRA accounts, auditing the classification of on-street parking revenue, and building a risk-based monitoring dashboard. Future research should use monthly or daily transaction data to estimate causal impacts more rigorously through before-after, interrupted time series, or difference-in-differences designs.

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