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Analysis of Parking System Development Using Electronic Parking Terminals (EPT) to Improve Services and Revenue in Jakarta

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Abstract: This study discusses the performance issues of the Electronic Parking Terminal (EPT) under the Parking Management Unit of the DKI Jakarta Provincial Transportation Agency due to its dependence on the French Cale Web Office (CWO) system. Since May 2021, the CWO system has experienced disruptions, leaving the TPE unable to operate online. This has had a significant impact on agency performance, delayed employee salary payments, and decreased parking management revenue. The average contribution of parking taxes to Local Own-Source Revenue (PAD) during 2018–2021 was only 0.99%, and TPE revenue fluctuated during 2016–2023. With the increasing number of vehicles in Jakarta, the development of the TPE system is expected to improve parking services, revenue efficiency, and support transparency and accountability in parking tax management. This study uses a mixed-methods approach, with quantitative analysis using SEM-PLS. The results show that service quality is the most dominant factor in increasing the system's net benefit, followed by information quality and system quality. Users and user satisfaction play a crucial mediating role in the indirect effect on Net Benefit. Dependence on a problematic CWO system negatively impacts TPE efficiency and revenue. Developing a local version of the TPE system is a more efficient and independent strategic step. In addition, the high operating cost-to-revenue ratio indicates the need for improved management efficiency.

Keyword: System Quality, Information Quality, Service Quality, User Satisfaction, Users, Net Benefits, Electronic Parking.

INTRODUCTION

Dependence on the French software system Cale Web Office (CWO), which operates the Electronic Parking Terminal (TPE), has significantly impacted the Parking Management Unit of the DKI Jakarta Provincial Transportation Agency. The TPE is an electronic, meter-based parking system that integrates in real time and is designed to increase transparency and efficiency in regional revenue collection. However, since May 2021, the CWO system has experienced disruptions. It has been unable to operate (offline), resulting in several problems,

including a decline in agency performance, delays in employee salary payments (only 50% have been paid), and a decline in revenue from the parking sector. Another obstacle that has contributed to this situation is the lack of socialization and field supervision, as mentioned by, even though TPE is actually effective in increasing parking tax revenue when it is functioning optimally.

Table 1 Parking Tax Revenue versus DKI Jakarta Provincial Tax Revenue

Pendapatan Pajak Parkir terhadap Pendapatan Pajak Daerah			
Year	**Revenue from Parking Tax**	**Local Tax Revenue**	**Percentage**
2018	Rp512.750.980.634	Rp43.327.136.602.811	1,18%
2019	Rp525.000.000.000	Rp45.707.400.003.802	1,15%
2020	Rp337.501.071.363	Rp37.414.754.711.193	0,9%
2021	Rp305.030.187.543	Rp41.606.307.405.630	0,73%
Average			0,99%

Source: BAPENDA DKI Jakarta

Based on data from the Jakarta Regional Revenue Agency (BAPENDA), the contribution of parking taxes to Regional Original Revenue (PAD) has declined from 2018 to 2021. In 2018, the contribution was 1.18%; in 2019, 1.15%; in 2020, 0.9%; and in 2021, 0.73%, with an average contribution of only 0.99%. This decline indicates a discrepancy between the potential of parking taxes and the actual revenue collected, mainly due to disruptions in the CWO system that affected the recording and reporting of transactions. In fact, the potential of the parking sector in DKI Jakarta is quite significant, given the high rate of private vehicle ownership and economic activity in densely populated urban areas.

Table 2 TPE Revenue Target and TPE Revenue Realization

Target Pendapatan TPE dan Realisasi Pendapatan TPE			
Year	**Target TPE Revenue**	**Realized TPE Revenue**	**Percentage**
2016	Rp6.600.000.000	Rp7.243.786.052	> 100%
2017	Rp23.000.000.000	Rp18.489.238.180	80%
2018	Rp17.916.000.000	Rp22.834.511.736	> 100%
2019	Rp17.672.236.000	Rp18.030.214.743	> 100%
2020	Rp23.597.135.984	Rp13.639.300.209	58%
2021	Rp12.076.697.737	Rp10.368.793.020	86%
2022	Rp21.444.986.100	Rp9.613.017.106	45%
2023	Rp9.510.087.507	Rp9.422.988.940	99%

Source: UP. Perparkiran Dishub DKI

Analysis of TPE revenue targets and actuals for the 2016–2023 period shows considerable fluctuation. Several years, such as 2016, 2018, and 2019, show achievements above 100% of the target, indicating good performance. However, in the following years, particularly 2020–2022, there was a drastic decline due to the COVID-19 pandemic and disruptions to the CWO system. In 2020, the realization reached only 58% of the target; in 2021, it was 86%; and in 2022, it dropped to 45%. This situation shows that foreign-based management systems that cannot operate sustainably significantly undermine the effectiveness of regional revenue management. In addition, reliance on foreign systems makes it difficult for the Parking Management Unit to perform repairs and maintenance independently.

As a precautionary measure, the Parking Management Unit of the DKI Jakarta Provincial Transportation Agency is developing a local, independent version of the TPE system.

This system was developed through middleware and supported by domestic components (TKDN). The goal is to ensure that transaction and revenue reporting processes can run online and in real-time without relying on foreign systems. Through this local system, it is hoped that all parking revenues will be deposited directly into the agency's deposit account, thereby avoiding late salary payments and potential revenue leakage. This step aligns with the mandate of DKI Jakarta Provincial Regulation Number 5 of 2012 on Parking, which requires the collection of parking taxes through an online system to ensure transparency and accountability.

Table 3 Active and Inactive TPE Data for the Period of February 2024

No	Administrative City	Road Section	Number of TPE	TPE Condition		Information
				Active	Inactive	
1	**Central Jakarta**	Jl. Juanda Raya	11	6	5	1 Pedestrian Relocation Machine
		Jl. Pecenongan	12	2	10	4 Pedestrian Relocation Machine
		Jl. Cikini Raya	6	2	4	4 Pedestrian Relocation Machine
		Jl. Juanda III	7	3	4	2 Pedestrian Relocation Machine
		Jl. Pintu Air Raya	15	9	6	
		Jl. H. Agus Salim	11	8	3	
2	**West Jakarta**	Jl. Pinangsia Raya	14	11	3	
		Jl. Pinangsia I	5	3	2	
		Jl. Pinangsia II	2	1	1	
		Jl. Pinangsia III	2	0	2	
		Jl. Pinangsia Timur	4	3	1	
		Jl. Petongkangan	9	5	4	
		Jl. Petak Baru	8	3	5	
		Jl. Brustru	3	1	2	
		Jl. Pintu Kecil Raya	13	8	5	
		Jl. Perniagaan Timur	10	5	5	
		Jl. HWI	4	0	4	4 Pedestrian Relocation Machine
3	**South Jakarta**	Jl. Falatehan	15	8	7	1 Pedestrian Relocation Machine
		Jl. Patah Raya	11	4	7	2 Pedestrian Relocation Machine
		Jl. Raden Fatah III	3	1	2	
		Jl. Sunan Ampel	4	2	2	
		Jl. Aditiawarman	3	2	1	
		Jl. Iskandarsyah	3	2	1	
		Jl. Panglima Polim I	2	1	1	

		Jl. Panglima Polim III	1	1	0
		Jl. Tebah Raya	4	3	1
		Jl. Melawai XIII	3	3	0
4	**East Jakarta**	Jl. Pegambiran	8	7	1
		Jl. Balai Pustaka Raya	5	2	3
		Jl. Pramuka	3	3	0
Summation			**201**	**109**	**92**

Source: UP. Perparkiran Dishub DKI

Field data shows that of the total 201 TPE units in the DKI Jakarta area, only 109 remain active, while the other 92 are inactive due to damage, relocation, or technical issues. Most of the inactive machines have suffered damage to their principal components (mainboards) or have been relocated due to the reorganization of pedestrian areas. This condition worsens the operational effectiveness of the electronic parking system, thereby limiting the potential for parking fees and taxes. Nevertheless, the existence of TPE is still considered to provide essential benefits, including reducing illegal parking, preventing revenue leakage, and potentially becoming an additional source of revenue through graffiti advertisements placed on TPE machines in accordance with DKI Jakarta Governor Regulation No. 148 of 2017.

In the future, the DKI Jakarta Transportation Agency will continue to innovate in developing the TPE system, including implementing the QRIS payment method, integrating vehicle data with emission test results, and improving digital system security. With the number of motor vehicles in DKI Jakarta continuing to increase each year, the need for an efficient and transparent parking system is becoming increasingly urgent. Therefore, the development of a locally-based TPE system using national technology is not only a technical solution but also a regional self-reliance strategy to optimize tax revenue, improve public service quality, and strengthen modern and sustainable parking management.

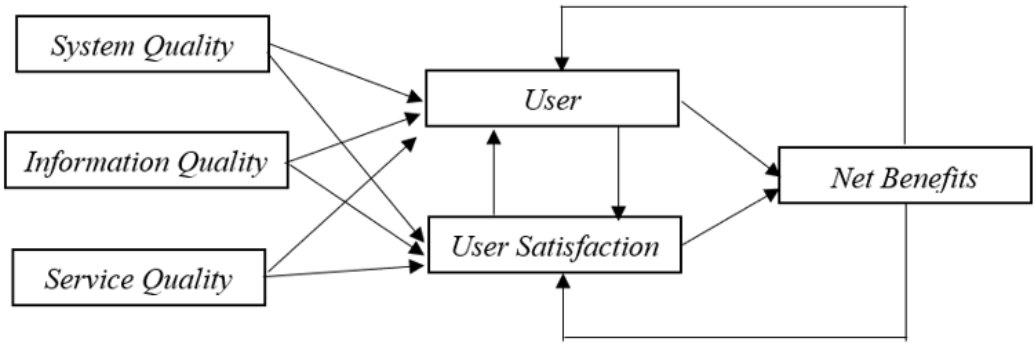

Figure 1 Constellation Relationship Between Variables

Hipotesis

1. It is suspected that system quality affects the Net Benefit of CWO TPE.
2. It is suspected that information quality affects the Net Benefit of CWO TPE.
3. It is suspected that service quality affects the Net Benefit of CWO TPE.
4. It is suspected that system quality affects user satisfaction with CWO TPE.
5. It is suspected that information quality affects user satisfaction (User Satisfaction) of CWO TPE.
6. It is suspected that service quality affects user satisfaction with CWO TPE.

7. It is suspected that system quality affects the use of CWO TPE.
8. It is suspected that information quality affects the use of CWO TPE.
9. It is suspected that service quality affects the use of CWO TPE.
10. It is suspected that there is an influence of CWO TPE usage (User) on CWO TPE user satisfaction (User Satisfaction).
11. It is suspected that there is an influence of CWO TPE usage (User) on CWO TPE Net Benefit.
12. It is suspected that there is an influence of CWO TPE user satisfaction (User Satisfaction) on CWO TPE Net Benefit.
13. It is suspected that system quality affects Net Benefit through the use (User) of CWO TPE.
14. It is suspected that information quality affects Net Benefit through the use (User) of CWO TPE.
15. It is suspected that service quality affects Net Benefit through the use (User) of CWO TPE.
16. It is suspected that system quality influences Net Benefit through CWO TPE user satisfaction.
17. It is suspected that information quality influences Net Benefit through CWO TPE user satisfaction.
18. It is suspected that service quality influences Net Benefit through CWO TPE user satisfaction.
19. It is suspected that system quality affects Net Benefit through the use (User) and user satisfaction (User Satisfaction) of CWO TPE.
20. It is suspected that information quality affects Net Benefit through the use (User) and user satisfaction (User Satisfaction) of CWO TPE.
21. It is suspected that service quality affects Net Benefit through usage (User) and user satisfaction (User Satisfaction) CWO TPE.
22. It is suspected that system quality affects Net Benefit through user satisfaction (User Satisfaction) and usage (User) CWO TPE.
23. It is suspected that there is an influence of information quality on Net Benefit through user satisfaction and usage of CWO TPE.
24. It is suspected that there is an influence of service quality on Net Benefit through user satisfaction and usage of CWO TPE.

METHOD

This study uses a mixed-methods, sequential explanatory design that combines quantitative and qualitative methods. The first stage involves collecting and analyzing quantitative data to obtain an overview of the relationship between variables, followed by qualitative data collection and analysis to deepen and explain the quantitative findings. This approach was chosen to ensure the research results would be more comprehensive and valid, and to provide an in-depth understanding of the phenomenon being studied: the development of an Electronic Parking Terminal (EPT)-based parking system in DKI Jakarta.

The research process consists of several systematic stages, starting with the introduction, data collection, problem identification, system design, measurement and evaluation, and culminating in the preparation of improvement proposals and conclusions. Data collection was conducted using both primary and secondary data. Primary data were obtained through direct interviews with relevant parties, including EPT managers, field officers, and officials from the DKI Jakarta Transportation Agency. Meanwhile, secondary data was collected from official documents and reports, including EPT revenue data for the 2018–2021 period. The research population consisted of all 6,078 EPT system users in DKI Jakarta. Sampling was conducted using probability sampling with the proportionate stratified random

sampling method to ensure that each EPT location group was represented in proportion to its size. Based on the Slovin formula, with a 5% margin of error, the sample size was 375 respondents. In addition to quantitative respondents, this study also involved qualitative informants, such as management officials and field operators, to enrich the data.

Data collection techniques included direct observation, in-depth interviews, and documentation. Observation was used to understand field conditions and TPE user behavior. Interviews were used to gather in-depth information on system implementation and obstacles, while documentation collected supporting data from various relevant official and visual documents. Data analysis was carried out using two approaches. First, a quantitative study was conducted using SmartPLS (Partial Least Squares) software to test the relationships among variables based on the DeLone and McLean Information System Success Model. This model was used to assess the success of the information system using system quality, information quality, and service quality as variables, in relation to user satisfaction and net benefits. The model evaluation includes the outer model (testing the validity and reliability of indicators) and the inner model (analyzing the causal relationships between latent variables using R-square, Q-square, and path coefficient). Second, the quantitative analysis results are reinforced by a qualitative study that interprets data from interviews and observations. Qualitative data can confirm, expand, or even correct quantitative results. With a combination of these two approaches, the study is expected to produce findings that are not only statistically significant but also contextually meaningful in improving the effectiveness and service of the electronic parking system in DKI Jakarta.

RESULTS AND DISCUSSION

Quantitative Analysis

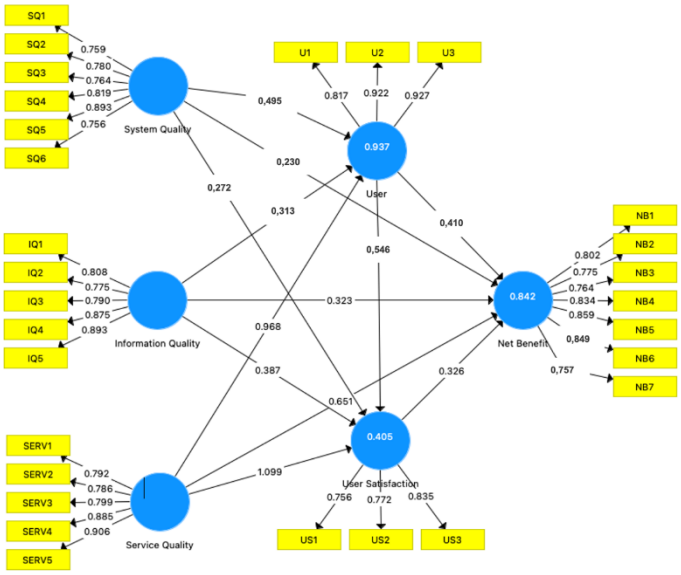

Figure 2 Output of the Partial Least Squares (PLS) program processing in the appendix

Table 4 Testing the Effect of Direct Output from Partial Least Squares

	Original Sample	Standard Deviation	T Statistics	P-values (1 Tail)	Conclusion

System Quality -> Net Benefit H1	0,230	0,033	6,932	0,000	H1 Accepted/Supported
Information Quality -> Net Benefit H2	0,323	0,039	8,260	0,000	H2 Accepted/Supported
Service Quality -> Net Benefit H3	0,651	0,102	6,349	0,000	H3 Accepted/Supported
System Quality -> User H4	0,495	0,016	7,021	0,000	H4 Accepted/Supported
Information Quality -> User H5	0,313	0,014	5,916	0,000	H5 Accepted/Supported
Service Quality -> User H6	0,968	0,008	126,270	0,000	H6 Accepted/Supported
System Quality -> User Satisfaction H7	0,272	0,051	5,385	0,000	H7 Accepted/Supported
Information Quality -> User Satisfaction H8	0,387	0,047	8,254	0,000	H8 Accepted/Supported
Service Quality -> User Satisfaction H9	1,099	0,161	6,830	0,000	H9 Accepted/Supported
User -> Net Benefit H10	0,410	0,099	8,013	0,000	H10 Accepted/Supported
User -> User Satisfaction H11	0,546	0,162	3,376	0,001	H11 Accepted/Supported
User Satisfaction -> Net Benefit H12	0,326	0,033	9,911	0,000	H12 Accepted/Supported

The results of hypothesis testing with regression using SmartPLS 4 are as follows:

1. The variable System Quality on Net Benefit has a path coefficient value of 0.230 and a P-value of 0.000 (< 0.05), meaning it has a positive and significant effect.
2. The variable Information Quality on Net Benefit has a path coefficient value of 0.323 and a P-value of 0.000 (< 0.05), meaning that it has a positive and significant effect.
3. The Service Quality variable on Net Benefit has a path coefficient value of 0.651 and a P-Value of 0.000 (< 0.05), meaning it has a positive and significant effect.
4. The variable System Quality on User has a path coefficient value of 0.495 and a P-Value of 0.000 (< 0.05), meaning that it has a positive and significant effect.
5. The variable Information Quality on User has a path coefficient value of 0.313 and a P-value of 0.000 (< 0.05), meaning that it has a positive and significant effect.
6. The variable Service Quality on User Satisfaction has a path coefficient value of 0.968 and a P-Value of 0.000 (< 0.05), meaning it has a positive and significant influence.
7. The variable System Quality on User satisfaction has a path coefficient value of 0.272 and a P-Value of 0.000 (< 0.05), meaning that it has a positive and significant effect.
8. The variable Information Quality on User satisfaction has a path coefficient value of 0.387 and a P-Value of 0.000 (< 0.05), meaning that it has a positive and significant effect.

9. The variable Service Quality on User Satisfaction has a path coefficient value of 1.099 and a P-Value of 0.000 (< 0.05), meaning that it has a positive and significant effect.
10. The variable User on Net Benefit has a path coefficient value of 0.410 and a P-value of 0.000 (< 0.05), meaning it has a positive and significant effect.
11. The variable User on User Satisfaction has a path coefficient value of 0.546 and a P-Value of 0.000 (< 0.05), meaning it has a positive and significant effect.
12. The variable User Satisfaction on Net Benefit has a path coefficient value of 0.326 and a P-Value of 0.000 (< 0.05), meaning it has a positive and significant effect.

Table 5 Testing the Effect of Indirect Output from Partial Least Squares

	Original Sample	*Standard Deviation*	*T Statistics*	*P-values (1 Tail)*	Conclusion
System Quality -> User -> Net Benefit **H13**	**0,114**	0,019	6,028	**0,000**	H13 Accepted/Supported
Information Quality -> User -> Net Benefit **H14**	**0,131**	0,020	5,065	**0,000**	H14 Accepted/Supported
Service Quality -> User -> Net Benefit **H15**	**0,210**	0,060	3,501	**0,003**	H15 Accepted/Supported
System Quality -> User Satisfaction -> Net Benefit **H16**	**0,189**	0,019	4,730	**0,000**	H16 Accepted/Supported
Information Quality -> User Satisfaction -> Net Benefit **H17**	**0,126**	0,023	5,437	**0,000**	H17 Accepted/Supported
Service Quality -> User Satisfaction -> Net Benefit **H18**	**0,358**	0,065	5,536	**0,000**	H18 Accepted/Supported
System Quality -> User -> User Satisfaction -> Net Benefit **H19**	**0,188**	0,023	6,285	**0,000**	H19 Accepted/Supported
Information Quality -> User -> User Satisfaction -> Net Benefit **H20**	**0,232**	0,028	7,840	**0,000**	H20 Accepted/Supported
Service Quality -> User -> User Satisfaction -> Net Benefit **H21**	**0,172**	0,054	3,170	**0,002**	H21 Accepted/Supported
System Quality -> User -> User Satisfaction **H22**	**0,227**	0,040	5,285	**0,000**	H22 Accepted/Supported

Information Quality -> User -> User Satisfaction **H23**	**0,129**	0,032	6,836	**0,000**	H23 Accepted/Supported
Service Quality -> User -> User Satisfaction **H24**	**0,529**	0,057	3,370	**0,001**	H24 Accepted/Supported

The results of hypothesis testing with regression using SmartPLS 4 are as follows:

1. The indirect effect of the System Quality variable on Net Benefit through User is 0.114 with a P-Value of 0.000 < 0.05, so H13 is accepted.
2. The indirect effect of the Information Quality variable on Net Benefit through User is 0.131 with a P-value of 0.000 < 0.05, so H14 is accepted.
3. The indirect effect of the Service Quality variable on Net Benefit through User is 0.210 with a P-Value of 0.003 < 0.05, so H15 is accepted.
4. The indirect effect of the System Quality variable on Net Benefit through User Satisfaction is 0.189 with a P-Value of 0.000 < 0.05, so H16 is accepted.
5. The indirect effect of the Information Quality variable on Net Benefit through User Satisfaction is 0.126 with a P-Value of 0.000 < 0.05, so H17 is accepted.
6. The indirect effect of the Service Quality variable on Net Benefit through User Satisfaction is 0.358 with a P-Value of 0.000 < 0.05, so H18 is accepted.
7. The indirect effect of the System Quality variable on Net Benefit through User and User Satisfaction is 0.188 with a P-Value of 0.000 < 0.05, so H19 is accepted.
8. The indirect effect of the Information Quality variable on Net Benefit through User and User Satisfaction is 0.232 with a P-Value of 0.000 < 0.05, so H20 is accepted.
9. The indirect effect of the Service Quality variable on Net Benefit through User and User Satisfaction is 0.172 with a P-Value of 0.002 < 0.05, so H21 is accepted.
10. The indirect effect of the System Quality variable on User Satisfaction through User is 0.227 with a P-Value of 0.000 < 0.05, so H22 is accepted.
11. The indirect effect of the Information Quality variable on User Satisfaction through User is 0.129 with a P-Value of 0.000 < 0.05, so H23 is accepted.
12. The indirect effect of the Service Quality variable on User Satisfaction through User is 0.529 with a P-Value of 0.001 < 0.05, so H24 is accepted.

Qualitative Analysis

What caused the Cale Web Office system at the Jakarta Transportation Agency's Electronic Parking Terminal (TPE) to go offline?

The cause of the Cale Web Office (CWO) system at the Jakarta Transportation Agency's Electronic Parking Terminal (TPE) going offline was a breach of contract by PT. Vertikal Akses Asia (PT. VAA) provides maintenance and system integration services for CWO. Based on the 2021 contract, PT. VAA was supposed to provide comprehensive maintenance services for the TPE system and machines; however, PT. VAA failed to fulfill this obligation, causing the CWO system to malfunction since May 2021. In addition, PT. VAA stated that the problem was caused by the closure of the original company's head office and branch offices (Flowbird), which disrupted the CWO system's real-time monitoring service. This has disrupted UP's digital collection and monitoring of parking revenue. Perparkiran. Despite three warning letters, PT. VAA has not responded, and the system remains inoperative.

What efforts have been made to develop the TPE parking system while the CWO system is offline?

While the CWO system is offline, UP, Perparkiran has taken several strategic steps as part of its mitigation efforts. One of these was to collaborate with PT. Aino Indonesia, which is

the official integrator and payment gateway of Bank Indonesia, supports payment system management. The revenue data collection process was carried out manually by backing up and uploading data from the TPE machine, with assistance from personnel from Satpel Sarana dan Prasarana. This data was then uploaded to the IWM AINO system for periodic revenue monitoring (H+30).

In addition, since October 2021, technical maintenance of TPE has been carried out by five internal personnel of UP. Perparkiran, which includes system repairs, battery (accu) replacement, and parking receipts. Seeing the importance of system sustainability, UP. Perparkiran then collaborated with PT. JakLingko Indonesia to develop a local version of TPE. This system was tested in April 2025 on Jl. H. Agus Salim (Sabang) as a pilot project with various new features relevant to developments in payment technology, including QRIS and QRIS Tap.

Is there a relationship between the operational costs of the TPE parking system and the revenue received?

There is a relationship between the operational costs of the TPE parking system and the revenue received. Based on data from 2017 to 2024, TPE operational costs absorbed an average of 60.60% of total TPE revenue. In 2018, the lowest operational costs were recorded at 44.45%, while in 2021, the highest cost burden was 86.37% of revenue. This shows that high operating costs directly affect UP's revenue efficiency. Perparkiran. In the context of BLUD (Regional Public Service Agencies), management efficiency is crucial because it underpins the provision of percentage-based incentives to parking attendants. Therefore, the development of a local version of TPE is expected to reduce operational costs (because the hardware and software are more flexible, domestically based, and easy to maintain), thereby increasing the net income ratio and strengthening the sustainability of the electronic parking management system.

CONCLUSION

The results show that all variables tested in the DeLone & McLean model have a positive effect on the Net Benefit of implementing the Electronic Parking Terminal (EPT) system in DKI Jakarta. However, the influence of variables on one another varies. System quality was found to have a significant effect, but its contribution was the lowest among the variables. This means that although a reliable system remains essential, this factor is not the primary determinant of the system's overall net benefit. Conversely, information quality has a moderate effect on Net Benefit, both directly and through intermediary variables. Accurate, relevant, and timely information has been shown to play a greater role in increasing the system's value than the system's quality. However, the most dominant factor in this study is service quality. The analysis results show that service quality has the strongest and most significant influence on Net Benefit, both directly and indirectly. Fast, responsive, and professional service is the key to increasing user satisfaction and perceived net benefit.

In addition, users and user satisfaction proved to be essential mediators in this research model. Active user involvement and their positive perceptions of the system had a significant effect on satisfaction and the benefits generated. User satisfaction served as an essential mediating channel, strengthening the indirect impact of system quality, information, and service on Net Benefit. Thus, efforts to improve the system's success do not depend solely on technical aspects, but also on user experience and convenience. From the field implementation side, the study found disruptions in the management of the TPE system due to the previous provider's default. VAA, which caused the Cale Web Office (CWO) system to malfunction since May 2021. This condition hampered real-time monitoring and reduced the efficiency and transparency of parking revenue. As a solution, the Jakarta Provincial Government collaborated with PT. JakLingko Indonesia to develop a local version of TPE based on TKDN hardware, proprietary software, and local servers. This step aligns with the 2025-2029 local government

electronification roadmap and offers advantages in terms of cost efficiency, system independence, and ease of maintenance.

The latest findings indicate an imbalance between TPE operational costs and revenue, with average operational costs exceeding revenue. This condition indicates the need for efficiency and optimization strategies to enable the electronic parking system to contribute more to increasing Local Own-Source Revenue (PAD). Overall, the research results confirm that TPE's success depends not only on the quality of the technology but also on service management, user satisfaction, and the system's operational and financial sustainability.

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