

The Influence of PLN Mobile Application Usage on Customer Service Quality Improvement at PT PLN (Persero) ULP Baubau City

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ABSTRACT

The rapid advancement of digital transformation in the public sector requires service providers to continuously enhance the accessibility, efficiency, and responsiveness of their services. As part of this transformation, PT PLN (Persero) introduced the PLN Mobile application to provide integrated digital services for its customers; however, empirical evidence regarding its effect on customer service quality, particularly in smaller and non-metropolitan service units, remains limited. This study aims to analyze the effect of PLN Mobile application usage on the improvement of customer service quality at PT PLN (Persero) ULP Baubau City. A quantitative explanatory survey design was employed, and the sample was determined using the Slovin formula, resulting in 100 respondents selected through purposive sampling. Data were analyzed using simple linear regression analysis with the assistance of IBM SPSS Statistics version 26. The results indicate that PLN Mobile application usage has a positive and significant effect on customer service quality, with a t count value of $7.373 > t$ table value of 1.984 . Based on the R square (R^2) value, PLN Mobile application usage explains 68.9% of the variance in customer service quality. These findings confirm that digital service adoption serves as an important antecedent of service quality improvement and extend the application of the SERVQUAL model to the context of a non-metropolitan public utility service unit. Practically, the findings provide a basis for PT PLN (Persero) to strengthen the features, system reliability, and user experience of the PLN Mobile application in order to further improve customer service quality.

Keywords: PLN Mobile Application, The Improvement of Customer Service Quality

1. INTRODUCTION

The rapid development of information and communication technology (ICT) has changed many aspects of everyday life, including the way public services are delivered. Advances in digital technology have encouraged organizations to adopt digital transformation to improve service quality and efficiency. Digital technology helps simplify service processes, improve access to services, and strengthen communication between service providers and users. At the same time, people have higher expectations for public services that are easy to access, responsive, transparent, and able to meet their needs. Therefore, digital transformation has become an important strategy for organizations to provide better public services that meet the changing demands of society (Astuti et al., 2023).

To support digital transformation in the public sector, the World Bank Group introduced the GovTech concept. This initiative encourages governments to improve efficiency,

strengthen governance, and deliver public services that are more transparent, effective, and focused on citizens' needs. It also highlights the growing importance of digital transformation as a key strategy for improving the quality of public services (GovTech, 2020). As a result, many public organizations are adopting digital technologies not only to improve operational efficiency but also to enhance the quality of services provided to the public.

Service quality is an important factor in determining whether the services provided meet customer expectations. Higher service quality leads to greater customer satisfaction because customers receive services that are reliable, responsive, and appropriate to their needs (Nur & Fadili, 2021; Widiанти & Safuan, 2025). In digital services, service quality is commonly evaluated using the Service Quality (SERVQUAL) model developed by Parasuraman, Zeithaml, and Berry. The model measures service quality by comparing customer expectations with their perceptions across five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. Therefore, SERVQUAL has become one of the most widely used frameworks for assessing service quality in both conventional and digital public services (Parasuraman et al., 1988).

As part of its digital transformation strategy, PT PLN (Persero) introduced the PLN Mobile application in 2020 to provide integrated digital services for customers. The application allows customers to access various electricity services, including electricity bill payments, prepaid token purchases, new connection requests, power capacity upgrades, complaint submissions, and other electricity-related information. Through this application, PT PLN (Persero) aims to provide services that are more accessible, efficient, and responsive while improving customer satisfaction (Azzaki A et al., 2023).

Previous studies have shown that the PLN Mobile application has a positive effect on customer satisfaction (Azzaki A et al., 2023). Other researchers have also examined customer satisfaction and customer loyalty as indicators of successful digital service implementation (Nu'man Nashif Annawwaf & Nur Nawaningtyas Pusparini, 2024). However, research focusing specifically on the relationship between PLN Mobile usage and customer service quality remains limited. In addition, most previous studies have been conducted in large cities with relatively high levels of digital literacy. Consequently, there is still limited evidence regarding the effect of digital services on service quality in smaller service units and non-metropolitan areas.

Preliminary observations at PT PLN (Persero) ULP Baubau revealed that some customers have limited knowledge of the features and benefits of the PLN Mobile application, leading to its underutilization. This condition motivated the present study to examine the effect of PLN Mobile usage on customer service quality. The findings are expected to provide empirical evidence on the effectiveness of digital services while offering practical recommendations for PT PLN (Persero) to further improve the quality of its customer services.

Based on this theoretical framework and previous empirical findings, this study argues that PLN Mobile application usage, as a form of digital service innovation, is expected to enhance

customer service quality by improving the tangibility, reliability, responsiveness, assurance, and empathy dimensions of service delivery conceptualized in the SERVQUAL model (Parasuraman et al., 1988). This argument is supported by previous findings showing that mobile-based public service applications significantly improve customer satisfaction and service efficiency (Azzaki A et al., 2023; Darmawan & Bagia, 2022; Yusuf et al., 2025). However, most of these studies were conducted in large urban service units, leaving a theoretical and empirical gap regarding how digital service usage affects service quality in smaller, non-metropolitan service units such as PT PLN (Persero) ULP Baubau City. Building on this theoretical foundation and the identified research gap, the present study proposes the following hypothesis: H1: PLN Mobile application usage has a positive and significant effect on customer service quality at PT PLN (Persero) ULP Baubau City.

2. METHODS

2.1 Research Design

This study employed a quantitative approach using an explanatory survey design with a cross-sectional approach (Sofya et al., 2024) to examine the effect of PLN Mobile application usage on customer service quality at PT PLN (Persero) ULP Baubau. The research design was selected to investigate the influence of the independent variable, namely PLN Mobile application usage, on the dependent variable, namely customer service quality. Data were collected through a structured questionnaire distributed to customers of PT PLN (Persero) ULP Baubau who had used the PLN Mobile application. The study was conducted from March to May 2026, covering instrument development, data collection, and data analysis.

2.2 Population and Sample

The population of this study consisted of all 92,433 customers of PT PLN (Persero) ULP Baubau who had used the PLN Mobile application. Considering the time and resource constraints of the study, the sample size was determined using the Slovin formula with a 10% margin of error, calculated as $n = N / (1 + N.e^2) = 92,433 / (1 + 92,433 \times 0.1^2) \approx 100$, while respondents were selected through a purposive sampling technique (Sugiyono, 2015). This technique was employed to ensure that the selected respondents met the predetermined criteria, namely customers who had used the PLN Mobile application and were willing to complete the questionnaire. Based on this calculation, a total of 100 respondents were included in the study. The use of a 10% margin of error, rather than the more conventional 5%, is acknowledged as a limitation that may reduce the precision of the estimates, as further discussed in the limitations section.

Data were collected using a structured questionnaire developed to measure the variables of PLN Mobile application usage and customer service quality. The conceptual framework of this study positions PLN Mobile application usage (X) as the independent variable influencing customer service quality (Y), consistent with the digital service model applied in previous PLN Mobile studies (Azzaki A et al., 2023; Nu'man Nashif Annawwaf & Nur Nawaningtyas

Pusparini, 2024). The PLN Mobile application usage variable was measured using indicators adapted from Azzaki A et al. (2023) and Nu'man Nashif Annawwaf & Nur Nawaningtyas Pusparini (2024), namely ease of access, completeness of service features, frequency of use, and accuracy of information provided. The customer service quality variable was measured using the five SERVQUAL dimensions developed by Parasuraman et al. (1988) — tangibles, reliability, responsiveness, assurance, and empathy — as adapted in Nur & Fadili (2021) and Widiandi & Safuan (2025). All items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to assess respondents' level of agreement with each statement (Simamora, 2022). Prior to data analysis, the research instrument was tested for validity and reliability to ensure that each indicator accurately and consistently measured the intended research constructs.

2.3 Data Analysis

The research data were analyzed using IBM SPSS Statistics version 26. The data analysis procedure consisted of descriptive statistical analysis to describe the characteristics of the data, validity and reliability tests to evaluate the quality of the research instrument (Ghozali, 2016; Simamora, 2022), classical assumption tests comprising normality and heteroscedasticity tests to ensure the regression model met the required statistical assumptions (Ghozali, 2016), and simple linear regression analysis to examine the effect of PLN Mobile application usage on customer service quality (Ghozali, 2016; Sugiyono, 2015). All statistical tests were conducted at a 5% significance level.

3. RESULTS AND DISCUSSIONS

3.1 Instrumen Testing

3.1.1 Validity Test

Table 1. Validity Test

Variable	Number Of Item	R Range	Table R	Result
PLN Mobile Applications	12	0.561-0.777	0.1966	Valid
Service Quality	10	0.704-0.840	0.1966	Valid

As presented in Table 1, the validity test results indicated that all questionnaire items measuring both the PLN Mobile application usage and customer service quality variables had corrected item-total correlation coefficients (r-values) exceeding the critical r-value of 0.1966. The r-values for the PLN Mobile application usage variable ranged from 0.561 to 0.777, while

those for the customer service quality variable ranged from 0.704 to 0.840. Therefore, all questionnaire items were considered valid and were retained for subsequent data analysis.

3.1.2 Reliability Test

Table 2. Reliability Test

Variabel	Total Statemen ts	<i>Alpha Cronbach 's</i>	Critic al Value	Notes
PLN <i>Mobile</i> Application (X)	12	0.872	0.6	Reliab el
Service Quality (Y)	10	0.928		

As shown in Table 2, the reliability test results showed that both research variables achieved Cronbach's Alpha coefficients exceeding the established minimum threshold, indicating that all measurement instruments were reliable. These findings suggest that the questionnaire items demonstrated good internal consistency, as reflected by the respondents' relatively consistent responses across all indicators. Therefore, the research instrument was considered suitable for further statistical analysis to examine the effect of PLN Mobile application usage on customer service quality at PT PLN (Persero) ULP Baubau.

3.2 Classical Assumption Tests

Classical assumption tests were conducted to ensure that the regression model satisfied the required assumptions prior to hypothesis testing. The normality test, performed using the Kolmogorov–Smirnov method, produced an Asymp. Sig. (2-tailed) value of 0.110, which exceeded the 0.05 significance level. This result indicates that the regression residuals were normally distributed. Furthermore, the heteroscedasticity test based on the scatter plot showed that the residuals were randomly dispersed above and below the zero line without forming any discernible pattern. This finding indicates the absence of heteroscedasticity in the regression model. Therefore, the regression model satisfied the classical assumptions and was considered appropriate for subsequent hypothesis testing.

3.3 Hypotesis Testing

3.3.1 Simple Linear Regression Test

Table 3. Simple Linear Regression Test

Coefficients ^a		
	Unstandardiz ed	Standardiz ed

Model		Coefficients		Coefficients
		B	Std. Error	Beta
1	(Constant)	1.992	5.034	
	PLN Mobile	.758	.103	.597

a. Dependent Variable: Service Quality

As presented in Table 3, the simple linear regression analysis produced the following regression equation:

$$Y = 1.992 + 0.758X + e$$

The constant value of 1.992 indicates that when PLN Mobile application usage is assumed to be zero, the predicted customer service quality score is 1.992. Meanwhile, the regression coefficient of 0.758 is positive, indicating that each one-unit increase in PLN Mobile application usage is associated with a 0.758-unit increase in customer service quality, assuming that all other factors remain constant. Furthermore, the standardized beta coefficient of 0.597 indicates a positive relationship of moderate-to-strong strength between PLN Mobile application usage and customer service quality.

3.3.2 Partial t-Test

Table 4. Partial t-Test

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.992	5.034		.396	.693
	PLN Mobile	.758	.103	.597	7.373	.000

a. Dependent Variable: Service Quality

As shown in Table 4, the t-value of 7.373 exceeded the critical t-value of 1.984, with a significance value of 0.000 ($p < 0.05$). These findings indicate that PLN Mobile application usage has a positive and statistically significant effect on customer service quality. Therefore,

the results support the proposed hypothesis that the use of the PLN Mobile application contributes to improving customer service quality at PT PLN (Persero) ULP Baubau.

3.3.3 Coefficient of Determination (R^2)

Table 5. Coefficient of Determination (R^2)

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.830 ^a	.689	.686	2.898
A. Predictors: (Constant), PLN Mobile				
B. Dependent Variable: Service Quality				

As presented in Table 5, the coefficient of determination (R^2) was 0.689, indicating that 68.9% of the variance in customer service quality could be explained by the PLN Mobile application usage variable. The remaining 31.1% of the variance was attributable to other factors not included in the research model.

DISCUSSIONS

The findings of this study indicate that the use of the PLN Mobile application has a positive and statistically significant effect on customer service quality at PT PLN (Persero) ULP Baubau. These results suggest that the adoption of digital services through the PLN Mobile application enhances service quality by providing customers with faster, more convenient, and more efficient access to electricity-related services. The application offers a range of features, including outage reporting, electricity bill payment, prepaid electricity token purchases, self-meter reading, and electricity service requests, enabling customers to access services without visiting a service office. These findings demonstrate that the digital transformation implemented through the PLN Mobile application contributes to improving the effectiveness, efficiency, and responsiveness of service delivery, thereby providing a better service experience for customers.

These findings can be explained by the fact that digital service delivery enables customers to access a wide range of services anytime and anywhere. Service processes that were previously conducted through conventional channels have become more practical, faster, and more transparent, thereby enhancing customers' perceptions of service quality. In addition, the use of digital applications enables the company to disseminate information more efficiently, streamline complaint handling processes, and respond more promptly to customer needs. Therefore, the PLN Mobile application serves not only as a digital service platform but also as

a strategic tool for improving the quality of public service delivery in a manner that is more responsive to customer needs.

The findings of this study are consistent with those reported by (Darmawan & Bagia, 2022), who found that the implementation of mobile-based public service applications significantly improves service efficiency for the community. The present study further strengthens the empirical evidence that the utilization of digital services through the PLN Mobile application not only enhances customer satisfaction, as reported by (Yusuf et al., 2025), but also contributes to improving service quality. These consistent findings indicate that digital service innovation facilitates faster, more accessible, and more responsive service delivery, thereby providing a better service experience for customers. The findings are further supported by (Robetam Simanjuntak et al., 2024), who concluded that the service quality provided through the PLN Mobile application has a positive and significant effect on customer satisfaction. Furthermore, (Rachel Rebbeca Kaunang, Riane Johnly pio, 2025) argued that service quality, whether delivered through the PLN Mobile application or through conventional face-to-face services, plays a crucial role in enhancing customer satisfaction and encouraging customers to continue utilizing digital services. The consistency of these findings reinforces the results of the present study, demonstrating that the implementation of the PLN Mobile application not only improves service efficiency but also delivers a more effective, responsive, and customer-oriented service experience.

In addition to demonstrating a statistically significant effect, the findings also indicate that the use of the PLN Mobile application makes a substantial contribution to explaining variations in customer service quality. This suggests that the adoption of digital applications is one of the key factors in improving service quality. Nevertheless, customer service quality is also influenced by other factors beyond the scope of the present research. These factors include the competence of service personnel, the responsiveness in handling service disruptions, the quality of network infrastructure, the effectiveness of information systems, and customers' satisfaction with the services received, all of which have been shown in prior studies to jointly shape customers' overall perception of service quality (Nur & Fadili, 2021; Robetam Simanjuntak et al., 2024; Rachel Rebbeca Kaunang, Riane Johnly pio, 2025). Therefore, improving service quality should not rely solely on optimizing the use of the PLN Mobile application but should also be supported by organizational capacity, competent human resources, and comprehensive service management practices.

4. CONCLUSION

This study concludes that the use of the PLN Mobile application has a positive and statistically significant effect on improving customer service quality at PT PLN (Persero) ULP Baubau. The findings indicate that the utilization of digital services through the PLN Mobile application contributes to enhancing service quality by providing easier access to services, accelerating service processes, and improving the efficiency of service delivery. These findings

highlight the importance of digital transformation as a strategic approach to improving public service quality in the electricity sector.

Theoretically, this study contributes to the service quality literature by extending the application of the SERVQUAL model (Parasuraman et al., 1988) to the context of digital public services, demonstrating that mobile application usage can be conceptualized as a determinant of customer-perceived service quality rather than merely a satisfaction driver. These findings reinforce and extend prior studies conducted primarily in large, urban service units (Azzaki A et al., 2023; Darmawan & Bagia, 2022), by providing empirical evidence from a smaller, non-metropolitan service unit context, thereby broadening the theoretical generalizability of the digital service–service quality relationship within the public utility sector.

From a practical perspective, the findings provide valuable insights for PT PLN (Persero) to continuously enhance the PLN Mobile application through feature improvements, increased system reliability, and a better user experience to ensure more effective and responsive customer service. Future research is recommended to extend the proposed research model by incorporating additional variables that may influence service quality, such as system quality, perceived ease of use, customer trust, customer satisfaction, and customer loyalty. Furthermore, future studies may be conducted across different service units or geographical regions and employ longitudinal research designs to provide a more comprehensive understanding of the long-term impact of digital services on service quality.

This study has several limitations. First, the research was conducted exclusively among customers of PT PLN (Persero) ULP Baubau; therefore, the findings cannot be generalized to all service units of PT PLN (Persero). Second, the study employed a cross-sectional research design, which captures respondents' perceptions and conditions at a single point in time. Third, the study examined only one independent variable, namely the use of the PLN Mobile application. Consequently, other factors that may influence customer service quality were not included in the analysis. Fourth, due to time and resource constraints, the sample size was determined using a 10% margin of error rather than the more conventional 5%, which may reduce the precision of the estimates relative to a larger sample. These limitations may restrict the generalizability of the findings. Nevertheless, they do not diminish the validity of the results within the context of the study, as all data collection and analytical procedures were conducted systematically in accordance with the adopted research methodology.

5. REFERENCES

- Astuti, R., Baihaqi, A., & Hidayatullah, G. M. (2023). *Efektivitas Aplikasi Pln Mobile Dalam*. 591–601.
- Azzaki A, Rahmayayani N, & Nazar J. (2023). Efektivitas Aplikasi PLN Mobile dalam memberikan informasi terkait pemadaman listrik oleh PT PLN UNit layanan pelanggan 50 kota. *Sakato Law Journal, I No. 2, J(2)*, 291–298.
- Darmawan, K. D., & Bagia, I. W. (2022). Service Quality Before and After the Implementation

- of the PLN Mobile Application at PT PLN (Persero) Customer Service Unit. *International Journal of Social Science and Business*, 6(1), 60–65. <https://doi.org/10.23887/ijssb.v6i1.43989>
- Ghozali, I. (2016). *Aplikasi Analisis Multivariate dengan Program IBM SPSS 23* (8th ed.). Badan Penerbit Universitas Diponegoro.
- GovTech. (2020). *Introduction*. November. <http://operationsportal.worldbank.org/secure/P169482/home>.
- Nu'man Nashif Annawwaf, & Nur Nawaningtyas Pusparini. (2024). Analisa Tingkat Kepuasan Pelayanan pada Aplikasi PLN Mobile dengan Metode Service Quality. *Neptunus: Jurnal Ilmu Komputer Dan Teknologi Informasi*, 2(4), 192–206. <https://doi.org/10.61132/neptunus.v2i4.453>
- Nur, M., & Fadili, D. A. (2021). Pengaruh Kualitas Pelayanan Dan Fasilitas Terhadap Kepuasan Pelanggan Travellers Hotel Jakarta. *Jurnal Pemasaran Kompetitif*, 5(1), 38. <https://doi.org/10.32493/jpkpk.v5i1.10151>
- Parasuraman, a, Zeithaml, V. a, & Berry, L. L. (1988). SERQUAL: A Multiple-Item scale for Measuring Consumer Perceptions of Service Quality. In *Journal of Retailing* (Vol. 64, p. 28). [https://doi.org/10.1016/S0148-2963\(99\)00084-3](https://doi.org/10.1016/S0148-2963(99)00084-3)
- Rachel Rebbeca Kaunang, Riane Johnly pio, S. ingried A. (2025). *Pengaruh Kualitas Layanan dan Pemanfaatan Teknologi Informasi melalui Aplikasi PLN Mobile terhadap Kepuasan Pelanggan pada*. 16(2).
- Robetam Simanjuntak, Sulaiman Helmi, Trisninawati, & Muji Gunarto. (2024). Peranan Kualitas Layanan pada Aplikasi PLN Mobile dan Harga terhadap Kepuasan Pelanggan di PT. PLN (Persero) UP3 Palembang ULP Rivai. *Velocity: Journal of Sharia Finance and Banking*, 4(2), 89–107. <https://doi.org/10.28918/velocity.v4i2.8750>
- Simamora, B. (2022). Skala Likert, Bias Penggunaan dan Jalan Keluarnya. *Jurnal Manajemen*, 12(1), 84–93. <https://doi.org/10.46806/jman.v12i1.978>
- Sofya, A., Novita, N. C., Afgani, M. W., & Isnaini, M. (2024). Metode Survey: Explanatory Survey dan Cross Sectional dalam Penelitian Kuantitatif. *Edu Society: Jurnal Pendidikan, Ilmu Sosial Dan Pengabdian Kepada Masyarakat*, 4(3), 1696–1708. <https://doi.org/10.56832/edu.v4i3.556>
- Sugiyono, P. D. (2015). Metode Penelitian Kuantitatif, Kualitatif Dan R&D. In *Bandung Alfabeta*.
- Widianti, Y. I., & Safuan, S. (2025). Pengaruh Kualitas Layanan Terhadap Kepuasan Dan Loyalitas Pelanggan. *Jurnal Lentera Bisnis*, 14(3), 3469–3483. <https://doi.org/10.34127/jrlab.v14i3.1746>
- Yusuf, B., Arif, M. R., & Rukaiyah, S. (2025). The Influence of Service Quality and Digital Service Innovation of PLN Mobile on Customer Satisfaction of PT PLN (Persero) Customer Service Implementation Unit (UP3) Mamuju. *Jurnal Online Manajemen ELPEI*, 5(2 SE-), 1680–1689. <https://doi.org/https://doi.org/10.58191/jomel.v5i2.455>