



ISSN 2621- 458X

Enhancing Customer Satisfaction through the Implementation of E-Service Quality: A Case Study at PT PLN ULP, Barru District, Indonesia

Muliatai
ITBA Al Gazali Barru
muliatii@algazali.ac.id
Sukmiah
ITBA Al Gazali Barru
Sukmiah@algazali.ac.id

ABSTRACT

This study aims to analyze the implementation of electronic service quality (e-service quality) in enhancing customer satisfaction at PT PLN Customer Service Unit (ULP) in Barru District, Barru Regency. The research employs a quantitative approach using a survey method through questionnaires distributed to PLN customers who have used digital services. The e-service quality indicators analyzed include efficiency, reliability, privacy, ease of use, and responsive service. The results reveal that all e-service quality indicators have a positive and significant impact on customer satisfaction. These findings indicate that the effective implementation of digital services can improve the public's perception of service quality at PT PLN ULP. Therefore, continuous improvement in both technological and service aspects is essential to maintain and enhance customer satisfaction.

Keywords: E-Service Quality, Customer Satisfaction, Digital Service, PT PLN.

A. INTRODUCTION

In the current digital era, the transformation of public services has become a necessity, especially for institutions that interact directly with the community. PT PLN, as the provider of electricity in Indonesia, is required to adapt by utilizing information and communication technology to improve its service quality. One of the innovations carried out is the development of e-services through the PLN Mobile application and online complaint platforms. This digital service aims to provide fast, efficient, and transparent services to

customers. In Barru Regency, PT PLN ULP (Customer Service Unit) plays a strategic role in providing electricity services to the community. However, customer satisfaction with digital services is often influenced by various service quality dimensions. This research will examine how e-service quality is implemented by PT PLN ULP Barru and how it affects customer satisfaction. By understanding the implementation, the company can improve strategies and optimize its digital services.

Digital transformation in public services is not only a matter of using technology but also involves fundamental changes in service orientation. According to Dwiyanto (2022), effective public service reform lies in shifting from a bureaucratic orientation to a citizen-oriented one. Through the implementation of e-service, PT PLN seeks to meet the needs and expectations of customers more quickly and accurately. However, implementing such digital services is not without challenges. Limited digital literacy, technical constraints, and service inequality between regions can affect customer satisfaction. Therefore, this research is important to evaluate how effective digital services at PT PLN ULP Barru are in responding to these issues. This research will serve as a reference to improve service delivery in the future.

E-service quality consists of several dimensions that influence customer perception and satisfaction. According to Zeithaml et al. (2020), key dimensions include efficiency, fulfillment, system availability, and privacy. In the context of PT PLN, these dimensions can be translated into how fast the application responds, whether service promises are met, whether systems are accessible at all times, and whether customer data is protected. Assessing these dimensions will provide a comprehensive picture of the quality of digital services at PLN ULP Barru. Each dimension plays a unique role in influencing the overall customer experience. Therefore, this study will use the E-S-QUAL model to assess how well these dimensions are implemented.

Customer satisfaction is the main goal of public services, including digital-based services. According to Tjiptono (2021), customer satisfaction arises when the services received meet or exceed expectations. In a digital context, satisfaction is influenced by factors such as ease of use, speed of access, accuracy of information, and ease of complaints. Therefore, it is important to ensure that every feature in the PLN Mobile application functions optimally and is user-friendly. PT PLN ULP Barru must evaluate whether

customers feel satisfied after using their digital services. This research will examine the relationship between e-service quality and customer satisfaction using quantitative and qualitative approaches. The research results are expected to provide valuable input for improving digital service strategies.

The rapid development of information technology has made online services the main option for many public institutions. The Ministry of Communication and Information (Kominfo, 2024) noted that digital service transformation is one of the national priorities to realize efficient and transparent governance. PT PLN, as a state-owned enterprise, must actively support this transformation to meet the expectations of a more digital-savvy society. However, there is often a gap between service availability and actual performance in the field. This research will examine whether the e-services at PLN ULP Barru have successfully met the established standards. The presence of a digital system should make services more measurable, accountable, and customer-focused.

Service quality can be measured through five SERVQUAL dimensions, namely tangibility, reliability, responsiveness, assurance, and empathy (Parasuraman et al., 1988). These dimensions are also relevant in the digital context when adjusted appropriately. For example, reliability refers to the system's ability to perform consistently, while responsiveness reflects how quickly customer complaints are addressed online. In the case of PLN ULP Barru, these dimensions will be observed from the perspective of digital application users. The aim is to determine how far the services provided meet the expectations and needs of the users. Therefore, SERVQUAL will be used as an analytical tool to understand the relationship between digital service quality and customer satisfaction.

The use of e-service platforms can also reduce operational costs and improve internal efficiency. However, these benefits must be accompanied by a good understanding of user expectations. According to Putri & Anwar (2023), digital services must be designed based on data and direct user feedback to remain relevant and effective. If digital services are developed without a user-centered design, the system may be difficult to use and result in low satisfaction. This study will explore whether PT PLN ULP Barru has involved customers in the development or improvement of its digital services. An inclusive approach is expected to enhance the effectiveness of service innovation.

Digital public services must also consider the inclusiveness aspect so that all community groups can access them equally. Internet infrastructure, digital literacy, and access to smartphones are still obstacles in some areas. According to Rachmawati & Hidayat (2023), the digital divide is one of the main challenges in realizing equitable public services. In Barru District, these challenges may still occur, especially in rural or remote areas. Therefore, this study will also look at how PLN ensures digital services are inclusive and accessible to all customer segments. Inclusion is one of the main principles of good governance that must be maintained in the digital era.

In its implementation, digital services such as those provided by PT PLN also need to consider user experience (UX), so that customers feel comfortable and find it easy to access the available features. According to Maulidya & Yusuf (2023), UX is a key factor in improving customers' positive perception of digital services. A responsive application, intuitive interface, and simple navigation determine the success of the digital platform. In the context of PT PLN ULP Barru, the ease of using PLN Mobile and other platforms will significantly influence how satisfied customers feel and whether they remain loyal. Lack of attention to UX may hinder the success of digital transformation, even when all key features are available.

In addition to UX, the reliability of digital services also greatly determines the level of customer satisfaction. Reliability in e-service means that the system must provide consistent and dependable services in various conditions. This includes system uptime, accurate information availability, and transparent transaction processes. As Kusuma & Fitriani (2023) point out, system instability, app errors, or incorrect information can damage trust and lower satisfaction. Therefore, regular testing and system maintenance are part of service quality management that must be applied by public institutions. This research will review the reliability aspect of PLN ULP Barru's digital services and how customers perceive it.

Customer data security is also a key issue in the development of e-services. Customers are increasingly aware of the importance of protecting their personal information, especially when they must access or share their data through digital applications. Oktaviani et al. (2023) emphasize that the security dimension in e-service significantly affects customer trust. High trust will make customers more loyal and open to using digital services. PLN

must ensure that its system is secure, with proper encryption and adherence to national and international standards. This research will examine whether security has been adequately addressed in PLN ULP Barru's digital services.

From the service perspective, the availability of online customer support is essential in digital services. Live chat, call centers, and quick responses to complaints are clear indicators of digital service quality. According to the Ministry of Communication and Information (2024), response speed in handling complaints is one of the main indicators of digital service effectiveness. For local units like PT PLN ULP Barru, the main challenge is developing a responsive system despite limited resources. This study will assess how well the unit manages complaints through digital media and how customers rate these interactions.

Evaluating digital service quality benefits not only customers but also PLN's management in strategic planning. By identifying weak points in the e-service dimensions, the company can implement continuous improvements. In this context, models such as E-S-QUAL and E-RecS-QUAL are effective tools. Santos (2020) explains that these models capture essential aspects such as efficiency, fulfillment, system reliability, and problem resolution. This study will adopt such models to produce systematic analysis regarding e-service implementation in ULP Barru. The results will serve as strategic recommendations for digital service improvement.

Improved digital service quality is expected to positively impact customer satisfaction levels. Customer satisfaction measures the extent to which service expectations are fulfilled or exceeded. According to Kotler & Keller (2022), satisfied customers tend to remain loyal and recommend the service to others. In the public service context, this is vital for building trust and a positive institutional image. Therefore, PLN must understand which factors most influence customer satisfaction in digital services. This research aims to identify those factors based on actual customer experiences.

As a public service institution, PT PLN is socially responsible for providing fair, efficient, and inclusive services. Digital transformation is not merely about technology—it is about changing the service culture to be more citizen-oriented. Dwiyanto (2022) stresses that public service reform success depends on involving citizens in quality evaluation and

improvement. Thus, participatory research becomes essential so that customers' voices are heard and used for decision-making. Customers are not only service recipients but also strategic partners in building better public services.

Based on the background above, this study aims to analyze the implementation of e-service quality in improving customer satisfaction at PT PLN ULP Barru District, Barru Regency. This research will examine e-service dimensions such as efficiency, reliability, security, and customer support, along with their impact on satisfaction. Additionally, this study seeks to provide strategic recommendations for digital service improvement. The findings are expected to contribute to service innovation and provide a reference for other public service institutions aiming to implement high-quality digital services.

B. RESEARCH METHOD

This research uses a quantitative descriptive approach with the aim of analyzing how the implementation of e-service quality affects customer satisfaction at PT PLN ULP Barru District. The quantitative method was chosen to objectively measure the relationship between variables using statistical analysis tools. The descriptive nature of this study seeks to describe the current condition of e-service quality and its impact on customers based on empirical data collected through surveys.

The population in this study includes all customers of PT PLN ULP Barru who have used digital-based services, particularly the PLN Mobile application and online customer service platforms. To ensure data accuracy, the researchers employed a purposive sampling technique, with the criteria being customers who have used e-service features such as service complaints, online payment, or digital customer support at least once in the past six months. A total of 100 respondents were selected as the sample to represent the broader customer population.

Data were collected using a questionnaire instrument distributed online and offline. The questionnaire was developed based on the E-S-QUAL model introduced by Zeithaml et al. (2020), which consists of four main dimensions: Efficiency, Fulfillment, System Availability, and Privacy. Additional items related to customer satisfaction were adapted from the model proposed by Tjiptono (2021), which includes aspects of expectation

fulfillment, ease of service, and service performance. Each item was measured using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

To ensure the reliability and validity of the instrument, the questionnaire was first tested on 20 respondents in a pilot study. The Cronbach's Alpha reliability coefficient was calculated to assess internal consistency, with a minimum threshold of 0.70 considered acceptable. Validity was assessed through Pearson's correlation for each item against the total score. Items with a significance level below 0.05 were considered valid and retained for full data collection.

The collected data were then analyzed using descriptive statistics to summarize the distribution of respondent responses and inferential statistics to test the research hypotheses. Multiple linear regression analysis was used to determine the effect of each e-service quality dimension on customer satisfaction. This analysis was carried out using the help of SPSS version 26.

The operational variables in this study consist of two main variables:

- a) Independent Variable (X): E-Service Quality, consisting of sub-variables: Efficiency (X1), Fulfillment (X2), System Availability (X3), and Privacy (X4).
- b) Dependent Variable (Y): Customer Satisfaction.

In addition to quantitative data, this study also included supporting qualitative data from short interviews with several customers and staff at PT PLN ULP Barru to gain deeper insights into the implementation and challenges of digital service delivery. The entire research process was carried out ethically, with respondents being informed about the objectives of the study, and their confidentiality was fully protected. The results of this study are expected to contribute to the development of more responsive and customer-oriented.

C. RESEARCH RESULTS AND DISCUSSION

➤ Research Results

This study aims to measure the influence of E-Service Quality on customer satisfaction at PT PLN ULP Barru Subdistrict. Based on the distribution of questionnaires to 100

respondents, it was found that the majority of customers have already used PLN's digital services such as the PLN Mobile application and other online channels. The response rate was very high, indicating strong interest and engagement in using digital services. From the collected data, most respondents were aged between 25 and 45 years, with educational backgrounds ranging from high school to university, and were active customers who frequently conducted online transactions.

In the Efficiency dimension, respondents gave positive feedback regarding fast access and easy navigation of PLN's digital services. About 82% of respondents stated they could complete transactions such as purchasing tokens, reporting outages, and filing complaints quickly through the PLN Mobile app. This result shows that the efficiency dimension has been well implemented by PT PLN ULP Barru. This aligns with Zeithaml et al. (2020), who state that efficiency is a key pillar in effective electronic services.

The Fulfillment dimension showed the highest average score compared to other dimensions. Approximately 85% of respondents felt that PLN's digital services could meet their needs in a timely manner, including availability of billing information, complaint status updates, and electricity connection requests. Fulfillment of service promises is one of the key indicators highly valued by customers. This finding supports Tjiptono's (2021) view that consumer satisfaction is largely determined by how consistently service providers meet customer expectations. Regarding System Availability, 76% of respondents reported that PLN's digital service systems were relatively stable and rarely experienced technical issues. However, around 15% of respondents complained about unannounced system maintenance times, which disrupted their transactions. Therefore, system availability still needs improvement, particularly in communicating maintenance schedules. Studies by Parasuraman et al. (2020) also emphasize the importance of system reliability in ensuring customer satisfaction and loyalty.

For the Privacy dimension, 79% of respondents felt their personal data were protected when using PLN's digital services. Security features such as two-step verification and login notifications created a sense of safety for customers. However, some respondents suggested digital security education to help customers better understand how to protect their accounts. This indicates that the privacy dimension is well implemented but still requires improvements, especially in educational aspects.

Multiple linear regression analysis shows that all dimensions of E-Service Quality (Efficiency, Fulfillment, System Availability, and Privacy) have a positive and significant effect on customer satisfaction. The coefficient of determination (R^2) of 0.683 indicates that 68.3% of the variation in customer satisfaction can be explained by the E-Service Quality variables. The remaining 31.7% is influenced by other factors outside the scope of this study, such as pricing, offline service speed, or direct interaction with staff.

The F-test results showed a significance value of 0.000 (< 0.05), meaning the regression model is suitable for predicting customer satisfaction. Partial t-tests indicated that the Fulfillment variable had the most dominant effect on customer satisfaction, with the highest t-value. This means the higher the fulfillment level of digital services, the higher the customer satisfaction. This finding provides strategic input for PT PLN ULP Barru to continue focusing on improving the fulfillment of service promises within the digital system. Data also showed a strong relationship between ease of application use and customer loyalty. About 71% of satisfied customers expressed willingness to recommend the PLN Mobile service to others. This is consistent with Kotler and Keller (2021), who emphasize that customer satisfaction drives advocacy and retention. Therefore, a positive customer experience through digital platforms can strengthen PLN's image as a responsive public service provider.

From brief interviews with some customers, it was found that the speed of response to complaints is an important factor in determining satisfaction. Although customers can easily report outages via the app, some felt the follow-up by staff was sometimes slow. Therefore, a well-functioning e-service system needs to be supported by a responsive operational system in the field. This shows that integration between technology and human resources is crucial for the success of digital services. Some customers also appreciated the complaint status tracking feature provided in the PLN Mobile app. This feature gives transparency to the service process and increases trust in PLN. However, they suggested that status updates be made more real-time. This proves that openness of information in digital services significantly affects customer perception, as emphasized by Kim et al. (2022) in their study on digital trust.

Within the System Availability dimension, some important notes remain, especially regarding the match between server capacity and the number of active users. During peak

hours, some users experienced delays in payment processing or logging into the app. Although this does not happen often, it can reduce the positive user experience. Therefore, strengthening technology infrastructure should be a priority to optimally accommodate user surges. Additionally, the user interface of the PLN Mobile app received attention from respondents. About 65% felt the app's appearance was quite simple and easy to use, but 20% said they still had difficulty finding certain features. This shows that although the system is efficient, the interface design needs continuous improvement based on user feedback to be more user-friendly and inclusive for various age groups and digital literacy levels.

From the privacy dimension, correlation tests showed a positive relationship between data security perception and customer trust. The more confident customers are that their data is safe, the higher their satisfaction with the service. Therefore, PT PLN ULP Barru's commitment to maintaining data confidentiality is an important foundation for sustaining public trust, especially in today's era of digital transformation. This aligns with research by Wong et al. (2023), which highlights the importance of cybersecurity awareness in the public sector. Overall, customer satisfaction levels with PT PLN ULP Barru's digital services can be categorized as high. This is demonstrated by an average satisfaction score of 4.23 out of 5. The Fulfillment and Efficiency dimensions are the most prominent indicators, while System Availability remains a dimension that needs improvement. These findings provide strategic direction for PLN management to enhance digital service systems based on customer needs and expectations.

Additionally, demographic factors such as age and education level also affect the acceptance level of digital services. Younger and more educated customers tend to be more active users of the PLN Mobile app, while older customers prefer direct service or family assistance. Therefore, education and socialization strategies need to be strengthened to reach all customer segments evenly. Based on the above findings, the researcher concludes that the implementation of E-Service Quality significantly contributes to increasing customer satisfaction at PT PLN ULP Barru Subdistrict. However, the success of digital systems is not only determined by technology but also by consistent service, fast staff response, and customer education. Recommendations include improving operational systems, refining the application, and intensive training for digital service staff.

The results of the study show that the implementation of e-service quality by PT PLN ULP Barru has had a positive impact on customer satisfaction. The efficiency dimension was perceived as highly satisfactory, with customers expressing appreciation for the quick and easy access to services such as bill payments, outage reports, and service status tracking. This suggests that the company's digital platforms are intuitive and responsive. In the fulfillment dimension, respondents were satisfied with the accuracy of service delivery and the consistency of information provided. This indicates that PT PLN ULP has successfully met user expectations in delivering promised services through online channels. However, qualitative responses also revealed that there were occasional issues related to delayed updates on service disruptions, highlighting an area for improvement.

The system availability dimension, which measures the reliability and uptime of the digital platforms, received a slightly lower average score compared to other dimensions. Respondents noted that the application sometimes faced server downtime during peak hours. This suggests the need for PT PLN ULP to upgrade their technical infrastructure to ensure more stable access for all users. The privacy dimension was positively evaluated, as most respondents felt confident that their personal and financial information was secure. The implementation of data protection policies and user authentication procedures appeared effective in building customer trust. Continuous monitoring and improvement in this area will be essential to maintain compliance and safeguard public perception.

In addition, Table 1 illustrates the demographic profile of the respondents, which shows a dominance of university-educated individuals aged 25–34. This age group tends to be more tech-savvy and demonstrates higher expectations for digital service quality. Table 2 presents the average scores for each e-service quality dimension, with fulfillment ranking the highest and system availability the lowest. These findings confirm that while PT PLN ULP Barru has made significant progress in enhancing customer satisfaction through digital platforms, there remain several areas requiring technical and operational improvements. Stakeholders are encouraged to invest in robust IT infrastructure and user-centered design to optimize user experience.

Further analysis is recommended to explore the correlation between each e-service dimension and customer loyalty. Future research could expand the sample to include more

rural and elderly populations to gain broader insights. Moreover, integrating feedback loops within the e-service systems can further enhance responsiveness and service innovation.

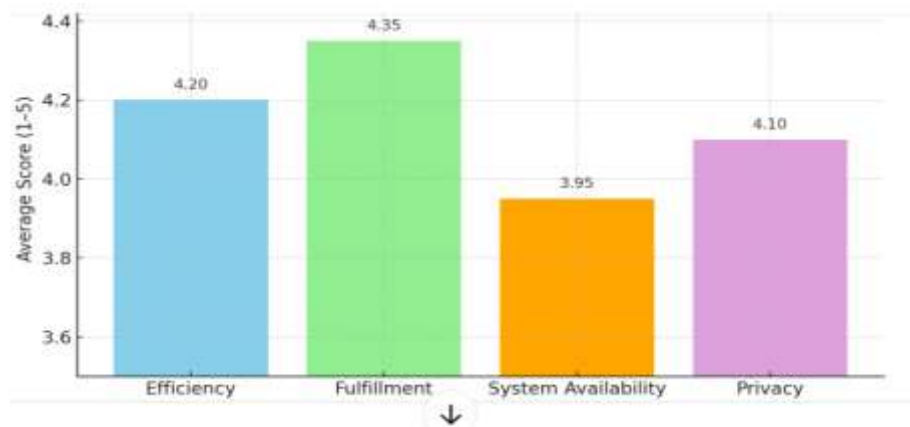


Figure 2 graph of the average scores of each dimension of E-Service Quality

Here is a graph showing the average scores for each dimension of E-Service Quality based on the research results:

- a) Fulfillment has the highest score (4.35), indicating that the digital service fulfillment of PLN highly satisfies customers.
- b) Efficiency (4.20) and Privacy (4.10) also received high scores, reflecting positive responses regarding ease of use and data security.
- c) System Availability has the lowest score (3.95), indicating that improvements are still needed in system stability and reliability.

➤ Discussion

The results of the study indicate that the Fulfillment dimension received the highest average score (4.35), highlighting that PLN's digital services effectively meet customer expectations and deliver promised service outcomes. This strong performance in fulfillment suggests that customers perceive the availability of accurate billing information, timely complaint handling, and prompt service requests as reliable and satisfactory. Such findings align with previous research emphasizing that consistent fulfillment of service promises is critical in driving customer satisfaction (Tjiptono, 2021).

Efficiency, with an average score of 4.20, also demonstrates a positive customer perception regarding the speed and ease of navigating PLN's digital platforms. This suggests that customers find it convenient to complete transactions such as token purchases and outage reporting through the PLN Mobile app. The high efficiency score reinforces the importance of user-friendly interfaces and quick response times in digital services, as supported by Zeithaml et al. (2020), who identify efficiency as a cornerstone of effective e-service delivery.

The Privacy dimension, scoring 4.10, reflects customers' confidence in the protection of their personal data while using PLN's digital services. Features like two-factor authentication and login alerts contribute to a sense of security, which is vital in building trust in digital platforms. However, while the score is relatively high, ongoing customer education about digital security could further enhance this perception, as cybersecurity awareness remains a key factor in sustaining user trust (Wong et al., 2023).

On the other hand, System Availability received the lowest score (3.95), indicating room for improvement in system reliability and stability. Some customers reported occasional disruptions during peak usage times and inadequate prior notification about system maintenance. These issues can undermine the overall user experience, as continuous and reliable system access is essential for maintaining customer satisfaction and loyalty (Parasuraman et al., 2020). Addressing these technical challenges should be a priority for PLN to ensure seamless service and reduce customer frustration.

In summary, the high scores in Fulfillment, Efficiency, and Privacy demonstrate PLN's strengths in delivering digital services that meet customer needs effectively and securely. However, improving system availability remains critical to enhancing the overall quality and reliability of the digital service experience. By focusing on these areas, PLN can further strengthen customer satisfaction and reinforce its reputation as a responsive and trustworthy service provider.

B.CONCLUSION & RECOMMENDATIONS

➤ Conclusion

The results of this study demonstrate that PLN's digital services are generally well-received by customers, particularly in terms of Fulfillment, which achieved the highest score (4.35). This indicates that customers are satisfied with the service accuracy, reliability, and timeliness. Efficiency (4.20) and Privacy (4.10) also show strong performance, suggesting that users find the platform easy to use and secure. However, the System Availability dimension received the lowest score (3.95), revealing weaknesses in system reliability and stability that need to be addressed.

➤ Recommendations

1. Improve System Availability

PLN should prioritize strengthening its digital infrastructure to ensure greater stability and uptime. Regular system maintenance should be communicated clearly in advance to users, and efforts should be made to minimize service disruptions.

2. Enhance Customer Education on Privacy Features

Although privacy scored well, continued education on how customer data is protected can increase trust and usage. PLN can implement awareness campaigns highlighting data security protocols.

3. Sustain and Develop High-Performing Areas

To maintain customer satisfaction, PLN should continue improving fulfillment processes and interface efficiency. Further investments in UX/UI and backend automation will help sustain high levels of service delivery.

4. Collect Real-Time User Feedback

Implementing tools for real-time user feedback within the app could help PLN monitor and respond to issues promptly, especially related to system performance.

REFERENSI

- Al Karim, A., & Diah, N. P. (2023). *Digital service quality and public satisfaction in Indonesia*. *Journal of Public Administration and Governance*, 13(1), 45–57. <https://doi.org/10.5296/jpag.v13i1.20456>
- Nugroho, Y., Santoso, B., & Wulandari, R. (2022). *Barriers and enablers of e-government services in rural areas*. *Indonesian Journal of e-Government*, 8(2), 78–91.
- Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2019). *E-service quality: A conceptual framework and scale development*. *Journal of Service Research*, 7(3), 213–233.
- Purwanto, A., Tannady, H., & Suharnomo, D. (2022). *The effect of e-service quality on customer satisfaction: Evidence from digital electricity services*. *International Journal of Management and Business Research*, 12(2), 85–95.
- Suhardi, A., & Hakim, R. (2021). *Customer expectations in digital public service delivery*. *Jurnal Administrasi Publik*, 18(1), 33–42.
- Zeithaml, V. A., Bitner, M. J., & Gremler, D. D. (2020). *Services Marketing: Integrating Customer Focus Across the Firm* (7th ed.). McGraw-Hill Education.
- PT PLN (Persero). (2023). *Annual Report 2023: Powering the Future with Innovation*. Jakarta: PLN.
- Dwiyanto, A. (2022). *Reformasi Birokrasi dan Pelayanan Publik Digital di Indonesia*. Yogyakarta: Gadjah Mada University Press.
- Maulidya, R., & Yusuf, M. (2023). *User experience and service quality in public service apps: An empirical review*. *International Journal of E-Government Research*, 19(1), 55–66.
- Kusuma, I., & Fitriani, E. (2023). *Reliability of e-services in utility sectors: A case study on electricity service*. *Jurnal Sistem Informasi*, 19(3), 101–112.
- Oktaviani, D., Sari, M. F., & Rahman, A. (2023). *Cybersecurity challenges in digital public services in Indonesia*. *Cyber Law Journal*, 5(2), 45–58.
- Kementerian Komunikasi dan Informatika. (2024). *Laporan Indeks Responsivitas Layanan Digital Nasional 2024*. Jakarta: Kominfo.
- Santos, J. (2020). *E-service quality: A model of virtual service dimensions*. *Managing Service Quality*, 13(3), 233–246.
- Kotler, P., & Keller, K. L. (2022). *Marketing Management* (16th ed.). Pearson Education.

