



The Quality of the JMO App's E-Services in Improving Service Quality at BPJS Ketenagakerjaan

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ABSTRAK

This study aims to analyze the role of e-service quality in the Jamsostek Mobile (JMO) application in improving the service quality of BPJS Ketenagakerjaan. The study uses a qualitative approach with a descriptive qualitative design. Observation, documentation, and in-depth interviews were the data collection methods. Research informants were selected using purposive sampling, specifically users of the JMO application and users of conventional services. Using the Miles, Huberman, and Saldaña model, data analysis involved data preparation, drawing conclusions, and data reduction. The results indicate that the use of the JMO application improves service quality, particularly regarding ease of access to services, time efficiency, information transparency, and reduced service queues at branch offices. The efficiency dimension emerged as the primary strength, as users experienced faster and more practical services. However, several challenges were identified in the dimensions of system availability, responsiveness, fulfillment, and privacy, such as system disruptions, slow service responses, services that are not yet fully integrated, and concerns regarding the security of users' personal data. This study concludes that e-service quality plays a strategic role in improving the quality of BPJS Ketenagakerjaan services. Therefore, improvements in system stability, data security, service integration, and public digital literacy are needed to further optimize the quality of digital services.

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1. Introduction

Digital transformation in the public service sector is driving a paradigm shift from conventional services toward electronic-based services that are more adaptive, efficient, and responsive to public needs. In this context, BPJS Ketenagakerjaan, as the institution responsible for labor social security in Indonesia, is required to provide services that not only fulfill social protection aspects but are also capable of addressing the challenges of digitalization by improving the quality of electronic services (e-service quality) and organizational performance effectiveness. This study integrates perspectives on service quality, technology acceptance, the resource-based view, and institutional theory to explain the relationship between digital service quality, performance effectiveness, and the labor market context.



Conceptually, service quality is rooted in the Service Quality Theory developed by (Yudiatmaja dkk., 2017), which emphasizes that service quality is determined by the gap between user expectations and perceptions. In subsequent developments, this concept evolved into e-service quality, which refers to the ability of technology-based services to provide an efficient, reliable, and secure experience for users (Zehir & Narcikara, 2016a; Zemblytė, 2015) developed the E-S-QUAL instrument, which encompasses the dimensions of efficiency, system availability, service fulfillment, and privacy. In the context of digital public services such as BPJS Ketenagakerjaan, these dimensions are crucial as they are directly related to service accessibility, the speed of the claims process, and the protection of participant data. Recent research indicates that the quality of e-services significantly influences user satisfaction, trust, and loyalty toward digital services (Jeseo dkk., 2024; Rita dkk., 2019; Tabaeian dkk., 2024; Thanasi-Boçe & Kulakli, 2023). Thus, the higher the quality of electronic services provided, the greater the likelihood of public satisfaction and trust in the institution.

In response to these issues, BPJS Ketenagakerjaan has developed digital-based service innovations through the Jamsostek Mobile (JMO) application. The presence of this application represents the implementation of the e-service quality concept, which refers to the ability of electronic systems to provide efficient, reliable, and secure services (Zehir & Narcikara, 2016b). Within the E-S-QUAL framework (Parasuraman dkk., 2005), the quality of digital services is determined by the dimensions of efficiency, system availability, service fulfillment, and privacy. Digital transformation in public services has been shown to improve efficiency, transparency, and service accessibility, particularly in the social security sector and technology-based services (Criado-Perez dkk., 2022; Suryono dkk., 2024; Wirtz, 2024). Conceptually, the implementation of digital services through JMO is expected to reduce the service burden at branch offices, accelerate service processes, and improve accessibility for participants.

However, the implementation of JMO has not yet fully yielded optimal results. Low application usage rates among participants, limited digital literacy, and ongoing system disruptions indicate that the quality of the electronic services provided has not yet fully met user expectations. From the perspective ("Technology Acceptance Model (TAM)," 2015), this situation can be explained by low perceptions of both the ease of use and the usefulness of the application, which ultimately affects the level of technology adoption by participants. In other words, the success of digital service implementation is not determined solely by the technology, but also by how that technology is accepted and used by users.

From an organizational perspective, improving the quality of digital services is closely linked to performance effectiveness. Performance effectiveness refers to the extent to which an organization successfully achieves its goals efficiently and (Iqbal dkk., 2015). (Gibson dkk., 2022) adds that organizational effectiveness can be measured through indicators of productivity, service quality, efficiency, and user satisfaction. Within this framework, the implementation of e-service quality serves as an enabler that allows organizations to improve performance through process automation, reduction of administrative errors, and faster service times. The digitization of public services has proven capable of enhancing organizational effectiveness through operational efficiency and improved service quality (Gantika, 2025; Mergel dkk., 2026). Thus, the quality of digital services not only influences the user experience but also directly contributes to the overall improvement of organizational performance.

Furthermore, in the context of labor, the quality of BPJS Ketenagakerjaan's services plays a crucial role in ensuring social protection for workers. A suboptimal service system risks hindering workers' access to their rights, such as social security claims and information regarding protection programs. Therefore, improving service quality through digitalization is



a necessity that is not merely administrative but also strategic in supporting workers' well-being.

In the labor context, BPJS Ketenagakerjaan services play a fundamental role in social protection for workers. According to Law No. 13 of 2003, labor encompasses all matters related to workers before, during, and after their employment period. To mitigate the social and economic risks faced by workers various social security programs provide this protection. As part of the BPJS Ketenagakerjaan system, the integration of digital services enables greater access to services, particularly for employees working in the informal sector. This also allows benefits to be distributed more efficiently.

Based on the above discussion, it can be concluded that there remains a gap between the implementation of digital service innovations via the JMO app and actual service conditions on the ground. Issues such as long queues, system disruptions, and low app utilization indicate that the quality of electronic services (e-service quality) and the effectiveness of BPJS Ketenagakerjaan's performance still require in-depth analysis. By integrating Service Quality Theory, the Technology Acceptance Model, the Resource-Based View, and Institutional Theory, this research is essential to analyze how e-service quality in the JMO application can contribute to improving service quality at the BPJS Ketenagakerjaan Kepanjen Branch.

2. Methods

This study employs a qualitative approach with the aim of gaining a deep understanding of the phenomenon of service quality, particularly in the implementation of digital services through the Jamsostek Mobile (JMO) application at BPJS Ketenagakerjaan. The qualitative method was chosen for its ability to comprehensively explore the experiences, perceptions, and interpretations of participants as service users, particularly in addressing various empirical issues such as long queues, system errors, and the suboptimal utilization of digital services. The research was conducted at a BPJS Ketenagakerjaan branch office serving as the research site, focusing on the interaction between service users and the service system, both conventionally (face-to-face) and through the JMO app as a form of digital-based public service innovation.

The three main methods used to collect data were observation, documentation, and in-depth interviews. In-depth interviews were conducted with BPJS Ketenagakerjaan participants as the primary informants to gather information regarding dimensions of e-service quality, such as usability, system reliability, information quality, service efficiency, and user satisfaction levels. Observations were conducted directly on service processes at branch offices, including queue dynamics, interactions between staff and participants, and practices in using digital services. Meanwhile, documentation was used to supplement research data through the collection of archives, service reports, and other documents relevant to the research focus.

For the purposes of this study, purposive sampling was used to select informants. In other words, informants were intentionally selected based on the research objectives: (1) BPJS Ketenagakerjaan participants who have used the JMO app and (2) participants who still use traditional services. The purpose of selecting these two groups of informants was to obtain a more comprehensive picture of how effective the use of digital services is. The Miles, Huberman, and Saldaña interactive analysis model was used to analyze the data in this study. Data reduction, data presentation, and drawing conclusions are the three main steps that form this model. To achieve data reduction, the processes of selecting, focusing, and simplifying relevant data were employed. To facilitate understanding of patterns and relationships among variables, data were presented in the form of systematic descriptive narratives. To arrive at an



acceptable interpretation, conclusions were drawn iteratively by identifying themes, patterns, and relationships among the findings.

This study employs two triangulation methods: source triangulation and methodological triangulation. In source triangulation, information from various informants is compared, while methodological triangulation involves comparing data from observations, documentation, and interviews. The researchers also used the member check method to ensure consistency between the data they obtained and the informants' experiences, as well as an audit trail to maintain a clear research process. Therefore, the research results are expected to possess a high level of scientific validity and credibility and to have a high degree of reliability.

3. Result and Discussion

The implementation of digital services through the Jamsostek Mobile (JMO) application demonstrates a shift toward a more modern, technology-based public service model. The digitization of services allows administrative processes to be carried out more quickly, practically, and flexibly compared to conventional service systems. The JMO app represents an innovation in public service aimed at making it easier for participants to access services anytime and anywhere, unrestricted by branch office operating hours. This situation demonstrates that digital transformation plays a crucial role in supporting the improvement of public service effectiveness in the era of information technology development.

In addition to providing easy access to services, the JMO app also contributes to enhancing the transparency of BPJS Ketenagakerjaan's services. Participants can directly monitor information regarding their Old-Age Benefits (JHT) balance, membership status, history of contributions, and the claims submission process through the digital system available in the app. This transparency of information has a positive impact on public trust, as participants gain independent access to information without having to rely entirely on service staff. With this openness of information, the quality of public services can be assessed as more accountable and responsive to the needs of the community.

In terms of organizational effectiveness, the implementation of the JMO app also helps reduce the administrative workload at BPJS Ketenagakerjaan branch offices. Before the introduction of digital services, most participants had to visit the office in person to check their data or submit specific service requests. This often resulted in long lines and increased workloads for service staff. With the JMO app, some services can be conducted online, thereby reducing the number of in-person visits to the office. This has a positive impact on employee work efficiency as service processes become more systematic and effective.

Additionally, research findings indicate that the quality of technological infrastructure plays a crucial role in the success of digital service implementation. A stable and easily accessible digital system enhances user comfort when utilizing the app's services. Conversely, if the system frequently experiences disruptions such as errors, maintenance, or slow loading times, this can lower user satisfaction with digital services. Therefore, strengthening server capacity, optimizing the application system, and regularly maintaining the technological infrastructure are essential measures to ensure the quality of digital services.

This study also found that the public's level of digital literacy influences the effectiveness of using the JMO application. Not all participants possess the same ability to use digital technology, particularly older participants or those not yet accustomed to using electronic-based applications. Some participants still experienced difficulties in the account registration process, logging into the application, or using certain features. This situation indicates that the



success of digital transformation is not only determined by technological sophistication but is also influenced by users' readiness to operate such digital systems.

In addition to digital literacy, the quality of service communication is also a key factor in ensuring the successful implementation of e-service quality. Information regarding system updates, maintenance schedules, and application usage procedures must be conveyed clearly and in a manner easily understood by participants. Effective communication between customers and service providers will help minimize misunderstandings and enhance public comfort in using digital services. Therefore, the Social Security Agency for Employment (BPJS Ketenagakerjaan) needs to improve its digital communication strategies so that service information can be received more effectively by all participants.

On the other hand, the implementation of the JMO application also enhances the institutional image of BPJS Ketenagakerjaan as a public service provider that is adaptable to technological advancements. The presence of digital services demonstrates the organization's commitment to improving service quality and meeting the needs of modern society, which seeks fast, practical, and efficient services. Thus, service digitalization serves not only as a technological innovation but also as an organizational strategy to strengthen public trust and satisfaction with public services.

Based on the results of qualitative research through interviews with users of the Jamsostek Mobile (JMO) app and BPJS Ketenagakerjaan service staff, findings indicate that the implementation of digital services via the JMO app makes a significant contribution to improving service quality, particularly in terms of ease of access and time efficiency.

Most informants stated that the JMO app simplifies access to various services, such as checking Old Age Security (JHT) balances, submitting claims, and obtaining membership information without having to visit a branch office in person. This is reflected in the statement by informant R1, who noted that "the JMO app is quite helpful because it allows access to services without visiting the office," as well as R5, who stated "it is very helpful and efficient." These findings indicate that the efficiency dimension of e-service quality is functioning well, as users experience ease and speed in accessing digital services. This aligns with the (Ladhari, 2010) which emphasizes that the quality of electronic services contributes to enhancing service effectiveness through the ease of using the system.

However, regarding the system availability dimension, various technical issues were still identified that affect service quality. Some informants reported system disruptions such as errors, slow loading times, and maintenance during specific periods. As stated by R2 ("experienced errors during login") and R3 ("slow loading during peak hours"), these conditions indicate that system stability remains suboptimal. This finding supports the research (Fanani dkk., 2024) which states that system reliability is a crucial factor in determining the quality of digital services because it directly affects user convenience.

Furthermore, regarding the fulfillment dimension, the JMO app is assessed as capable of meeting users' basic needs, particularly in providing information services and online claim submissions. However, these services are not yet fully digitally integrated, as there are still follow-up processes that must be conducted in person, such as data verification. This is underscored by R1 ("still need to visit the office for verification") and R4 ("does not fully meet needs"). These findings indicate a gap between user expectations and service delivery, as explained by (Maharani & Utomo, 2023) that service fulfillment in e-service quality is determined by the alignment between the services provided and user expectations.

Regarding the privacy dimension, the majority of informants stated that the JMO app is sufficiently secure to use as it is equipped with a login and verification system. However, some



users still express concerns regarding the security of personal data. This is evident from R3's statement feeling secure, while R4 expressed concerns about data protection. These findings indicate that system security aspects need to be continuously strengthened to enhance user trust, as highlighted by (Wardana dkk., 2024) that data security is a key factor in building trust in digital services.

Meanwhile, regarding the responsiveness dimension, the research results indicate that service responsiveness still needs improvement. Some informants complained about the slow response from customer service in handling complaints. This was mentioned by R1 ("the response was a bit slow") and R5 ("helpful but slow"). This situation impacts user satisfaction levels and indicates that responsiveness remains a weakness in digital services. This finding aligns with (Fauzi dkk., 2025) which states that response speed is a primary determinant of user satisfaction with electronic services.

In the contact dimension, although support services such as call centers and social media are available, their integration into the JMO app is still suboptimal. Users still have to switch to other platforms to get help, thereby reducing the overall efficiency of the service.

Table 1. Summary of E-Service Quality Findings for the JMO Application

E-Service Quality Dimensions	Key Findings	Informant Quotes	Implications
Efficiency	Easy and quick access	"Very helpful and efficient" (R5)	Improves service effectiveness
System Availability	Errors and slow loading	"Sometimes errors occur during login" (R2)	Reduce user convenience
Fulfillment	Not Fully integrated	"Still have to go to the office" (R1)	Service is not yet optimal
Privacy	Fairly secure, but there are still concerns	"A bit worried about data" (R4)	Trust need to be improved
Responsiveness	Slow service response	"Response takes a while" (R1)	Reduces satisfaction
Contact	Not yet integrated into the app	Requires switching platforms	Service efficiency is reduced

Research findings indicate that the quality of e-service on the JMO app plays a strategic role in improving the quality of BPJS Ketenagakerjaan services. The dimensions of efficiency and ease of access are key strengths supporting the digital transformation of public services. However, several aspects such as system reliability (system availability), service responsiveness, and feature integration remain challenges that need to be addressed.

These findings reinforce the argument in Service Quality Theory that service quality is determined by the alignment between user expectations and experiences, and align with the Technology Acceptance Model, which emphasizes the importance of ease of use and benefits in technology adoption. Digital service quality also contributes to user experience and public trust in service institutions (Alalwan dkk., 2025). Furthermore, from a Resource-Based View perspective, the optimization of digital systems such as JMO can serve as a source of organizational advantage if managed effectively.

Thus, efforts to improve service quality through the Jamsostek Mobile (JMO) application need to be strategically directed toward several key, mutually integrated aspects. First,



improving system stability and reliability is a top priority to minimize technical disruptions such as errors and slow loading times, ensuring the service remains consistently accessible to users. Second, accelerating customer service response times must be optimized so that any complaints or issues faced by participants can be resolved quickly and effectively, ultimately leading to increased user satisfaction.

Additionally, the comprehensive integration of service features into a single application platform is essential to prevent users from having to switch to other platforms, thereby maximizing service efficiency and convenience. Equally important, the strengthening of user data security systems must be continuously improved to build and maintain public trust in the digital services provided by BPJS Ketenagakerjaan.

Overall, these steps are expected to improve the quality of the user experience, strengthen satisfaction levels, and sustainably increase public trust in BPJS Ketenagakerjaan's digital services.

4. Conclusion

The research findings and discussion indicate that the provision of digital services through the Jamsostek Mobile (JMO) app contributes positively to improving service quality at BPJS Ketenagakerjaan. The presence of the JMO app facilitates service access for participants, improves time efficiency, and supports transparency regarding membership and social security for workers. This indicates that the implementation of e-service quality in digital-based public services plays a crucial role in supporting service effectiveness and enhancing the user experience. Research findings indicate that the efficiency dimension is the primary strength in the implementation of the JMO app, as users experience ease and speed in accessing services without having to visit a branch office in person. The digitization of services also helps reduce queues and the administrative burden on staff, making the service process more effective and structured.

However, the implementation of digital services through the JMO app still faces several challenges that hinder the optimization of service quality. Issues in the system availability dimension such as errors, slow loading times, and system maintenance remain common user complaints. Additionally, the responsiveness aspect indicates that customer service is not yet fully responsive in addressing participants' complaints. In the fulfillment dimension, digital services are also not yet fully integrated because some processes still require participants to visit the branch office in person. Meanwhile, in the privacy dimension, some users still have concerns regarding the security of their personal data. Furthermore, this study found that the public's level of digital literacy is crucial for the successful provision of digital services via the platform. Not all participants possess the same proficiency in using technology-based applications; therefore, education and guidance are necessary to ensure the optimal utilization of the JMO application. Overall, this study confirms that e-service quality in the JMO application plays a strategic role in improving the quality of BPJS Ketenagakerjaan services. Therefore, continuous development efforts are needed through improved system stability, faster service response times, application feature integration, enhanced data security, and increased public digital literacy. With these improvements, it is hoped that the quality of BPJS Ketenagakerjaan's services will become more effective and efficient, and will be able to increase public satisfaction and trust in digital-based public services.



5. References

- Alalwan, A. A., Algharabat, R., Abu El Samen, A., Albanna, H., & Al-Okaily, M. (2025). Examining the impact of anthropomorphism and AI-chatbots service quality on online customer flow experience – exploring the moderating role of telepresence. *Journal of Consumer Marketing*, 42(4), 448–471. <https://doi.org/10.1108/JCM-06-2024-6929>
- Criado, J. I., Alcaide-Muñoz, L., & Liarte, I. (2025). Two decades of public sector innovation: Building an analytical framework from a systematic literature review of types, strategies, conditions, and results. *Public Management Review*, 27(3), 623–652. <https://doi.org/10.1080/14719037.2023.2254310>
- Criado-Perez, C., Shinkle, G. A., Höllerer, M. A., Sharma, A., Collins, C., Gardner, N., Hank Haeusler, M., & Pan, S. (2022). Digital Transformation in the Australian AEC Industry: Prevailing Issues and Prospective Leadership Thinking. *Journal of Construction Engineering and Management*, 148(1), 05021012. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0002214](https://doi.org/10.1061/(ASCE)CO.1943-7862.0002214)
- Fanani, R. D., Wiguna, I. K. A. G., Iskandar, A. P. S., & Parwita, W. G. S. (2024). Innovative UI/UX Analysis of Cooperative Apps through Design Thinking. *Jurnal Galaksi*, 1(1), 33–42. <https://doi.org/10.70103/galaksi.v1i1.4>
- Fauzi, I. M., Nugroho, A. A., & Khoirunisa, A. (2025). Evaluation of SAPA WARGA Application System and User Satisfaction: Public Service Technology Management Perspective Based on PIECES Framework. *JURNAL SISFOTEK GLOBAL*, 15(1), 34. <https://doi.org/10.38101/sisfotek.v15i1.15836>
- Gantika, S. (2025). Public Service Transformation: A Literature Review on the Role of Technology in Improving Service Quality. *Golden Ratio of Social Science and Education*, 5(1), 46–52. <https://doi.org/10.52970/grsse.v5i1.952>
- Gibson, C. B., Dunlop, P. D., Majchrzak, A., & Chia, T. (2022). Sustaining Effectiveness in Global Teams: The Coevolution of Knowledge Management Activities and Technology Affordances. *Organization Science*, 33(3), 1018–1048. <https://doi.org/10.1287/orsc.2021.1478>
- Iqbal, M. Z., Akbar, S., & Budhwar, P. (2015). Effectiveness of Performance Appraisal: An Integrated Framework. *International Journal of Management Reviews*, 17(4), 510–533. <https://doi.org/10.1111/ijmr.12050>
- Jeseo, V., Lastner, M. M., & Black, H. G. (2024). Enhancing customer engagement behaviors via customer-to-customer interactions and identification. *Journal of Services Marketing*, 38(8), 975–993. <https://doi.org/10.1108/JSM-09-2023-0345>
- Kunz, W., Wirtz, J., Hartley, N., & Tarbit, J. (2024). The Importance of Corporate Digital Responsibility in a Digital Service World. Dalam L. Matosas-López (Ed.), *The Impact of Digitalization on Current Marketing Strategies* (hlm. 183–193). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-83753-686-320241011>
- Ladhari, R. (2010). Developing e-service quality scales: A literature review. *Journal of Retailing and Consumer Services*, 17(6), 464–477. <https://doi.org/10.1016/j.jretconser.2010.06.003>



- Maharani, I. G. A. I. S., & Utomo, R. G. (2023). Digital Banking Service Quality: The Modified E-Servqual Model & Importance-Performance Analysis (IPA). *2023 International Conference on Data Science and Its Applications (ICoDSA)*, 145–150. <https://doi.org/10.1109/ICoDSA58501.2023.10277373>
- Mergel, I., Edelman, N., & Haug, N. (2026). Outcomes of Value Co-Creation and Co-Destruction in the Digital Transformation of Public Services. *Digital Government: Research and Practice*, 7(1), 1–19. <https://doi.org/10.1145/3743148>
- Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality. *Journal of Service Research*, 7(3), 213–233. <https://doi.org/10.1177/1094670504271156>
- Rita, P., Oliveira, T., & Farisa, A. (2019). The impact of e-service quality and customer satisfaction on customer behavior in online shopping. *Heliyon*, 5(10), e02690. <https://doi.org/10.1016/j.heliyon.2019.e02690>
- Suryono, Z. C., Kancana, S., Fatah, Z. K., & Lambang, D. (2024). Analisis Business Model Canvas pada Start-up di Bidang Akuakultur (Studi Kasus: Efishery). *Jurnal Administrasi Bisnis (JABis)*, 22(2), 131. <https://doi.org/10.31315/jurnaladmbisnis.v22i2.12825>
- Tabaeeian, R. A., Hossieni, F. A., Fatehi, M., & Forghani Tehrani, A. (2024). Investigating the effect of augmented reality packaging on behavioral intentions in traditional Iranian nougat GAZ packaging. *British Food Journal*, 126(6), 2438–2453. <https://doi.org/10.1108/BFJ-11-2023-1046>
- Technology Acceptance Model (TAM). (2015). Dalam S. M. Dahlgaard-Park, *The SAGE Encyclopedia of Quality and the Service Economy*. SAGE Publications, Inc. <https://doi.org/10.4135/9781483346366.n221>
- Thanasi-Boçe, M., & Kulakli, A. (2023). Dimensions and outcomes of electronic service quality in the GCC countries. *International Journal of Quality and Service Sciences*, 15(3/4), 239–258. <https://doi.org/10.1108/IJQSS-02-2023-0016>
- Tonsi, A. A., Husain, K. S. M., & Yaqub, M. Z. (2025). IT Capabilities' Impact on Postponement and Supply Chain Viability of Retail Manufacturers: A Dynamic Resource-Based View. *Sustainability*, 17(4), 1437. <https://doi.org/10.3390/su17041437>
- Wardana, A. A., Kołaczek, G., & Sukarno, P. (2024). Lightweight, Trust-Managing, and Privacy-Preserving Collaborative Intrusion Detection for Internet of Things. *Applied Sciences*, 14(10), 4109. <https://doi.org/10.3390/app14104109>
- Wirtz, B. W. (2024). Digital Business Strategy. Dalam B. W. Wirtz, *Digital Business and Electronic Commerce* (hlm. 639–716). Springer International Publishing. https://doi.org/10.1007/978-3-031-50289-7_15
- Yudiatmaja, W. E., Alfiandri, A., & Hidayat, R. (2017). Far from Fire: The service delivery quality gap plaguing Indonesian Ports. *JKAP (Jurnal Kebijakan dan Administrasi Publik)*, 21(1), 31. <https://doi.org/10.22146/jkap.22713>
- Zehir, C., & Narcikara, E. (2016a). E-Service Quality and E-Recovery Service Quality: Effects on Value Perceptions and Loyalty Intentions. *Procedia - Social and Behavioral Sciences*, 229, 427–443. <https://doi.org/10.1016/j.sbspro.2016.07.153>



- Zehir, C., & Narcıkara, E. (2016b). E-Service Quality and E-Recovery Service Quality: Effects on Value Perceptions and Loyalty Intentions. *Procedia - Social and Behavioral Sciences*, 229, 427–443. <https://doi.org/10.1016/j.sbspro.2016.07.153>
- Zemblytė, J. (2015). The Instrument for Evaluating E-Service Quality. *Procedia - Social and Behavioral Sciences*, 213, 801–806. <https://doi.org/10.1016/j.sbspro.2015.11.478>