ASSESSING CUSTOMER SATISFACTION OF HALAL INSPECTION INSTITUTIONS USING SERVQUAL-AHP FOR HALAL LOGISTICS CERTIFICATION IN JABODETABEK

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ABSTRACT

Background: Halal logistics research in Indonesia is critical to ensure compliance with Islamic principles, enhance product safety and quality, and support business actors in the food, pharmaceutical, and manufacturing sectors to meet growing domestic and international demand. Currently, only 11% of logistics companies in Indonesia are halal-certified, indicating limited readiness to support halal supply chains by the end of 2024. High certification costs, complex procedures, and lengthy approval processes are key barriers.
Purpose: This study develops a service quality analysis-analytical hierarchy process (SERVQUAL-AHP) model to strengthen halal policy and standardization in Halal Inspection Bodies (LPH) located in the Jakarta, Bogor, Depok, Tangerang, and Bekasi (JABODETABEK) regions, in accordance with Law No. 33 of 2014 on Halal Product Assurance (JPH). aligning with Law No. 33 of 2014 on JPH.
Design/methodology/approach: Using a mixed-method approach with 77 logistics business actors and five experts. This study applies SERVQUAL, Importance Performance Analysis (IPA), and the AHP to identify service priorities and measure customer satisfaction using the Customer Satisfaction Index (CSI) at LPH.
Findings/Result: The results highlight priority areas for service improvement and indicate a high level of customer satisfaction, suggesting strong potential to further enhance the service quality of LPH in the JABODETABEK region
Conclusion: The study concludes that improving halal logistics certification To improve the quality of services at LPH, both responsiveness and assurance must be strengthened, particularly through secure digital systems and complete documentation. The findings also contribute theoretically by demonstrating the integration of SERVQUAL, IPA, AHP, and the CSI as a structured framework for evaluating and prioritizing service quality improvements in halal-certified services. Although the CSI is already high (CSI = 89%), the presence of SERVQUAL gaps is −0,19 indicates the need for continuous improvement to fully meet customer expectations.
Originality/value (State of the art): Previous studies on halal logistics mainly focus on food products and general logistics performance, while research on the service quality of halal logistics certification is limited. This study fills this gap by developing an integrated SERVQUAL–AHP model to evaluate service quality, prioritize improvements, and measure the CSI in halal logistics certification services provided by LPH in Indonesia.

Keywords: SERVQUAL, halal logistics, customer satisfaction, certification, complexity

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INTRODUCTION

Indonesia has strong potential to develop a global halal ecosystem because of its large Muslim population. This demographic advantage increases the demand for halal products and encourages the growth of halal-compliant industries. Halal logistics ensures that transportation, storage, and distribution maintain halal integrity throughout the supply chain (Rizaldy et al. 2024). However, despite the growth of halal products, halal logistics certification remains limited, with only 1,706 of the 15,848 logistics companies certified in 2024 (Statistik, 2024). This gap indicates structural challenges in certification capacity and highlights the need to improve the quality and accessibility of halal logistics certification.

Halal logistics is essential for maintaining consumer trust and business sustainability, particularly in Indonesia, the largest Muslim-majority country. In a halal supply chain, logistics activities such as transportation, warehousing, and distribution must maintain halal integrity in accordance with Islamic principles (Ab Talib et al. 2015; Tieman, 2011). However, logistics providers still face challenges, such as complex certification procedures, high investment costs, and a lack of harmonized halal logistics standards (Aufi et al. 2024). As illustrated in Figure 1, the VOSviewer bibliometric analysis identifies research themes linking service quality models and technology adoption while revealing a research gap in digital trust technologies for halal certification services (Van Eck & Waltman, 2010). Service quality analysis (SERVQUAL) research has evolved through three phases: the foundational phase of service quality theory (Berry et al. 1990; Perng et al. 2007), the expansion phase into logistics and halal supply chains (Arabelen & Kaya, 2021; Badruldin et al. 2012; Chen et al. 2020; Putri et al. 2021; Rejeb et al. 2021; Roy & Srivastava, 2022), and the recent phase emphasizing halal certification, digital logistics, and customer satisfaction (Noor, 2025; Sitanggang et al. 2024; Staub et al. 2024; Warnis et al. 2024).

This study addresses a significant research gap by integrating the SERVQUAL and analytical hierarchy process (AHP) frameworks to evaluate the service quality of halal logistics certification services provided by Halal Inspection Bodies (LPH) in Indonesia. Despite the growing body of research on service quality, halal supply chains, and certification systems, previous studies have not Specifically, an integrated SERVQUAL AHP approach was applied to assess the institutional performance of halal logistics certification services in the Indonesian context. Therefore, this study offers novelty by examining critical service factors, such as auditor reliability, document completeness, and data security, which are essential for the effective implementation of the Halal Product Assurance Law (JPH) and Government Regulation No. 42/2024. Beyond its practical contribution to improving certification services, this study advances the theoretical development of halal service quality literature by extending service quality evaluation models into the institutional domain of halal logistics certification. Specifically, this study integrates SERVQUAL, Importance–Performance Analysis (IPA), AHP, and the Customer Satisfaction Index (CSI) within a unified analytical framework to measure service performance, identify service quality gaps, determine improvement priorities, and provide a comprehensive assessment of customer satisfaction with LPH certification services.

An exploratory evaluative research approach was employed to assess the performance of the halal logistics certification services provided by LPH. This approach enables the systematic identification of service quality gaps, evaluation of customer satisfaction levels, and determination of priority areas for improving certification services within the halal logistics sector. To achieve these objectives, an integrated SERVQUAL–AHP framework was applied to analyze the key dimensions of service quality in halal certification services. SERVQUAL measures the gap between customer expectations and perceived service performance, whereas IPA identifies service attributes that require immediate improvement. In addition, the AHP determines the relative importance of service quality dimensions based on expert judgment, and the CSI provides a comprehensive evaluation of the overall customer satisfaction with LPH services. Through this integrated analytical framework, this study provides a structured basis for strengthening halal certification service performance and supporting policy improvements in accordance with Law No. 33 of 2014 on Halal Product Assurance and Government Regulation No. 42 of 2024.

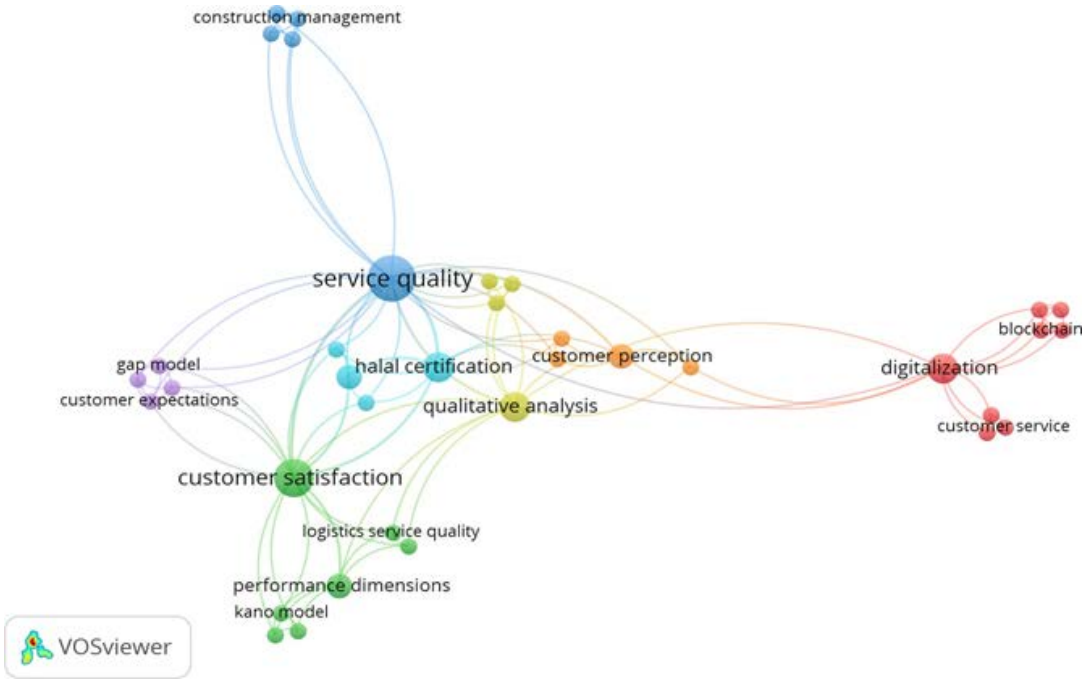

Figure 1. VOS Viewer related to Halal Logistics certification

The primary objective of this study was to evaluate the service quality of halal logistics certification services provided by LPH in the Jabodetabek region. This study aims to measure the level of customer satisfaction with certification services using the CSI as an indicator of overall service performance. In addition, this study seeks to identify the key dimensions of service quality that require improvement, highlighting the urgency of enhancing the effectiveness and reliability of halal logistics certification services**.** By applying an integrated analytical framework consisting of SERVQUAL, IPA, AHP, and CSI, this study systematically assesses service performance and determines priority areas for improvement. Ultimately, this research aims to provide empirical insights that can support the improvement of institutional service quality and strengthen the implementation of halal certification policies.

METHODS

This study uses both qualitative and quantitative data to evaluate halal logistics certification services. Qualitative data were obtained from the literature review and document analysis. Twelve publications from ScienceDirect, Emerald, Taylor & Francis, Springer, Wiley and Google Scholar were examined to identify research gaps and support the theoretical framework (Creswell & Plano Clark, 2011, 2018). Quantitative data were collected from halal-certified logistics companies in the Jabodetabek area. The population consisted of 641 certified logistics companies in 2024. These data provide the basis for measuring service quality and customer satisfaction in halal certification.

Data were collected using a structured questionnaire based on the SERVQUAL framework. The questionnaire measures five service quality dimensions: Tangibles, Reliability, Responsiveness, Assurance, and Empathy. Each dimension was measured using Likert-scale items to capture the respondents' perceptions. The respondents included supervisors, managers, and business owners involved in halal certification processes. A purposive sampling technique was applied to select respondents who had direct experience with certification services. A total of 77 respondents participated, meeting the recommended sample criteria for multivariate and AHP-based analyses (Hair et al. 2021; 2022).

Data analysis combines SERVQUAL, CSI, IPA, and AHP to evaluate certification service performance. SERVQUAL measures the gap between the expected and perceived service quality. The CSI calculates the overall customer satisfaction level. IPA identifies the service attributes that require improvement. The AHP determines the relative importance of each service dimension. Before analysis, validity was tested using Pearson item–total correlation, and reliability was tested using Cronbach's alpha with a threshold above 0.70. The conceptual framework guiding this study is presented in Figure 2.

This study applies an integrated SERVQUAL–AHP framework to evaluate and improve LPH halal logistics certification services. SERVQUAL identifies gaps between customer perceptions and expectations across 22 service indicators, while IPA translates.

These gaps are priority areas for improvement. The AHP then determines the strategic importance of each service dimension through expert-based pairwise comparisons, with priority weights calculated using eigenvector normalization. The consistency of expert judgments is evaluated using the Consistency Index (CI) and Consistency Ratio (CR) following Saaty (1980), where CR values below 0.10 indicate acceptable consistency. This integrated approach provides a comprehensive and reliable evaluation model that combines customer perceptions, operational performance, and expert judgment to support service quality improvement in halal logistics.

RESULTS

Demographic of Respondents

Based on the answers to the Questionnaire Statement Indicators, the respondent position, company scale, and type of logistics service are shown in Figure 3. Of the 77 respondents, 57.1% were supervisors or senior staff, 24.7% were logistics managers, and 18.2% were business owners, indicating that the participants had relevant experience with LPH certification services. Most halal-certified logistics companies were small-scale (39%), followed by large-scale (31.2%) and medium-scale (29.9%) companies. In terms of service type, 88.3% operated in distribution services (transportation, freight forwarding, and warehousing). Instrument validity was tested using Pearson item–total correlation and reliability using Cronbach's alpha with Python assistance, which showed that all items were valid ($r \geq 0.30$).

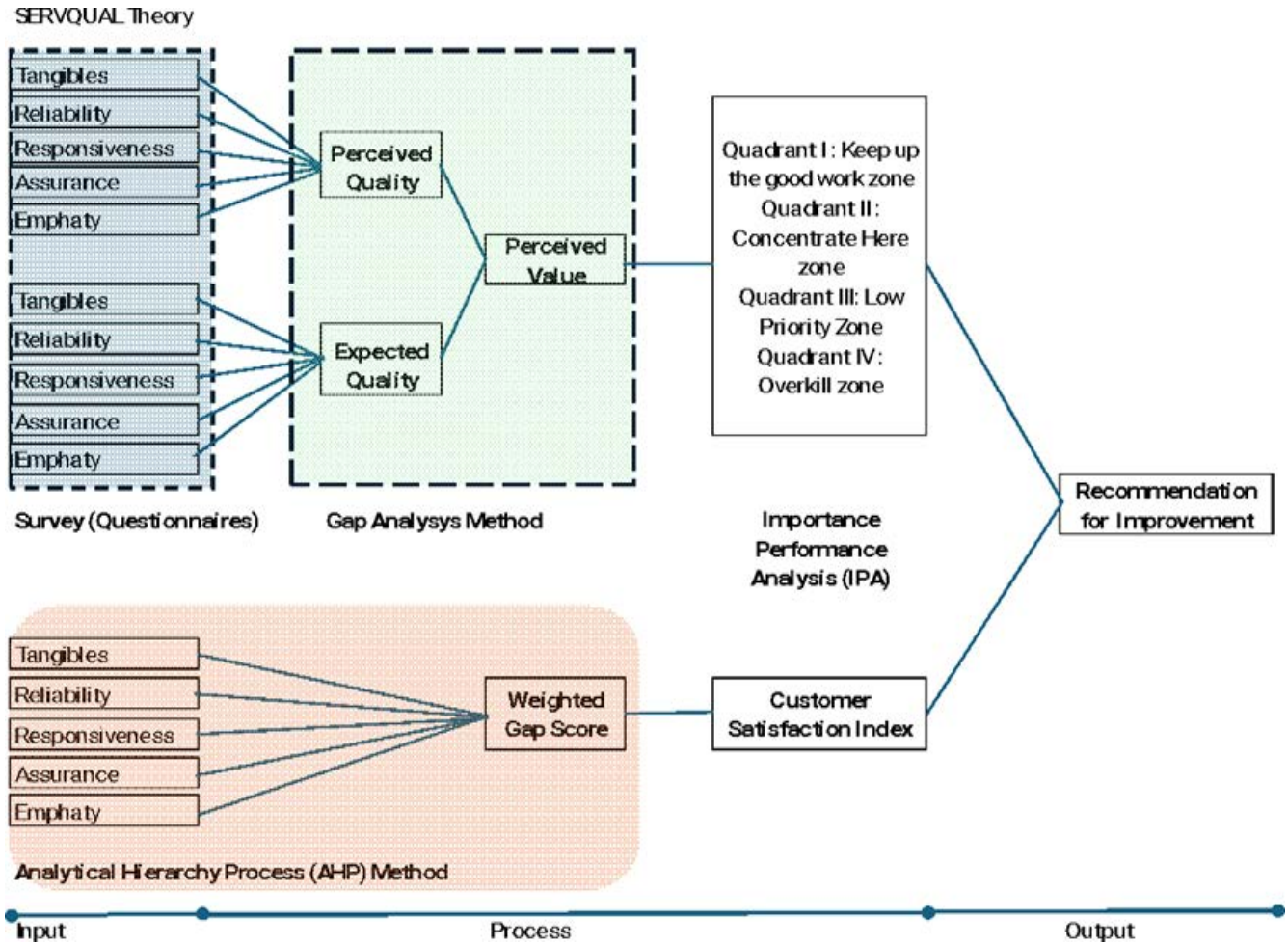

Figure 2. Conceptual framework related to halal logistics certification (Kurniawan & Putro, 2025)

Furthermore, the results of the reliability test processed by Python show that Cronbach's alpha for the reliability of perception and expectation, Cronbach's alpha Perception 0.984 is Excellent, and Alpha Expectation 0.990 is excellent. Service quality assessment through SERVQUAL at LPH in the process of optimizing halal logistics certification carried out by the LPH and identifying attributes in the SERVQUAL dimension that need to be improved based on service quality gap analysis. Validity instrument (item) perception and expectation factors test results of SERVQUAL halal logistics in Table 1.

The SERVQUAL results show negative gaps across all five dimensions (Figure 4), with the largest gap in Tangible (−0.227), followed by Responsiveness (−0.224), Empathy (−0.197), Reliability (−0.174), and Assurance (−0.146). The overall gap across the 22 indicators is −0.969, with an average perception score of 6.207, and an expectation score of 6.412. The largest gaps occurred in employee neatness (−0.429), facility availability (−0.403), and document completeness (−0.312), whereas supporting tools showed a positive gap (0.039). These SERVQUAL results were then mapped using IPA, as shown in Figure 5, where perception represents performance and expectation represents importance to identify priority areas for service improvement. The priority attributes identified in the IPA diagram were subsequently weighted using the AHP method to support service improvement in halal logistics certification.

Based on the IPA, the LPH service attributes were distributed across four quadrants, with Quadrants I and II representing the main strategic priorities. Quadrant I highlights highly important but underperforming attributes particularly document completeness, communication accessibility, data security, individual attention, and service hour convenience requiring immediate improvement, while Quadrant II reflects well-performed attributes that should be maintained, especially reliability, responsiveness, and assurance. To complement these findings, the AHP method using expert pairwise comparisons (RU–AHLI, CY–ABBI, AP–NLC, TJ–LPK, and NS–IWTL) was applied following the decision framework of (Saaty, 1980), indicating that assurance (ASS) and responsiveness (RES) are the most influential dimensions in halal logistics certification services, while reliability, tangible, and empathy play supporting roles, and tangibles are relatively less influential (Table 2).

In the SERVQUAL–AHP model, priority weights are derived from expectation scores to reflect the relative importance of each dimension of service. AHP determines these priorities, whereas GAP (perception–expectation) measures the difference between expected and perceived service performance. Thus, expectation weights represent strategic importance, and the GAP reflects the actual service performance.

The current level of LPH's customer service satisfaction

Then from the results of this weighting, the CSI value can be calculated with the following formula:

$$CSI = \frac{\sum_{i=1}^{k}\left(wi_i^{AHP} \times P_i^{(D)}\right)}{S_{max}} X\ 100\% \quad \ldots(1)$$

The formula refers to research (Alam & Mondal, 2019).

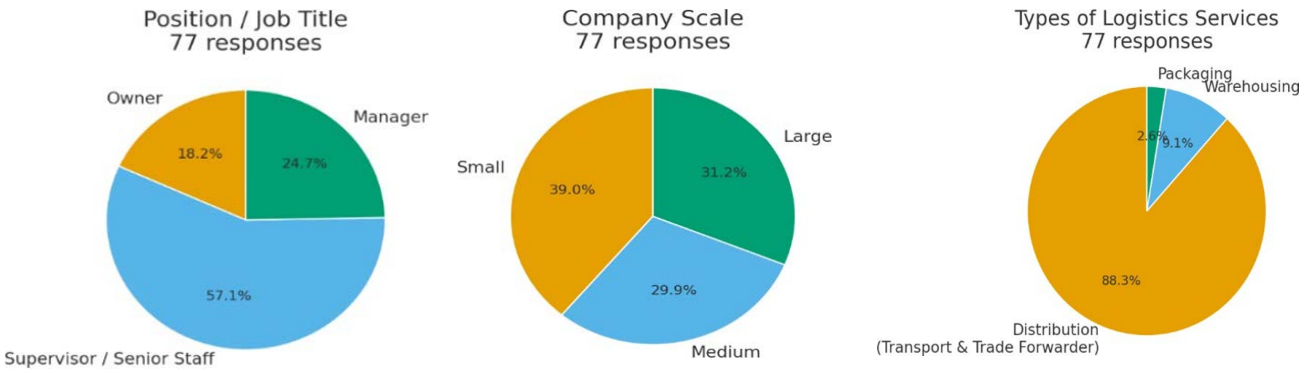

Figure 3. Comparison percentage of respondent position in logistics halal companies, company scales and types of logistics services

Table 1. Validity instrument (item) perception and expectation factors test results of SERVQUAL halal logistics

Item_Column	N_Valid	Pearson_r_ corrected Perception	Pearson_r_ corrected Expectation	p_value	Valid_(r >=0.30)
Physical facilities	77	0.820	0.733	0.0	Yes
Employee neatness	77	0.893	0.716	0.0	Yes
Supporting eqpmnt	77	0.858	0.831	0.0	Yes
Availability of facilities	77	0.887	0.808	0.0	Yes
Service accuracy	77	0.891	0.906	0.0	Yes
Consistency of promises	77	0.891	0.925	0.0	Yes
Auditor reliability	77	0.872	0.921	0.0	Yes
Clear information	77	0.913	0.949	0.0	Yes
Fast process	77	0.916	0.928	0.0	Yes
Complete documents	77	0.867	0.951	0.0	Yes
Quick response	77	0.576	0.952	0.0	Yes
Friendly service	77	0.700	0.964	0.0	Yes
Ease of communication	77	0.711	0.959	0.0	Yes
Auditor knowledge	77	0.791	0.883	0.0	Yes
Data security	77	0.928	0.923	0.0	Yes
Credibility	77	0.918	0.915	0.0	Yes
Polite attitude	77	0.928	0.945	0.0	Yes
Customer empathy	77	0.928	0.866	0.0	Yes
Individual attention	77	0.918	0.963	0.0	Yes
Service hour convenience	77	0.906	0.935	0.0	Yes
Flexibility	77	0.915	0.903	0.0	Yes
Accessibility	77	0.910	0.954	0.0	Yes

Table 2. Result of priority weight and weight prioritize of satisfaction index from expert about halal logistics certification

	Weight (W)					Gap					
Responden	RU	CY	AP	TJ	NS	average	expectation	Perception	Score (P-E)	Weighted	
Dimension	AHLI	AB BI	NLC	LP K	IW TL					Gap	Score
TAN	0.15	0.17	0.24	0.14	0.18	0.18	5.96	6.23	-0.264	-0.047	2
REL	0.44	0.05	0.14	0.26	0.25	0.23	6.29	6.46	-0.172	-0.039	3
RES	0.4	0.10	0.14	0.11	0.09	0.14	6.28	6.47	-0.195	-0.027	5
ASS	0.09	0.44	0.22	0.39	0.40	0.31	6.28	6.46	-0.182	-0.056	1
EMP	0.07	0.24	0.26	0.09	0.09	0.15	6.23	6.45	-0.214	-0.032	4
Total	1.00	1.00	1.00	1.00	1.00	1,00	31.04	32.06	-1.03	-0.20	

Among the SERVQUAL dimensions, assurance (ASS) contributed the largest weighted score, followed by responsiveness (RES), assurance (ASS), and reliability (REL). The CSI value reaches 89%, calculated as CSI = (6.23 / 7) × 100% = 89%, indicating that respondents are highly satisfied with halal certification services provided by LPH, consistent with the CSI interpretation framework proposed by (Ramez, 2012)

Key dimensions of service quality that need to be improved for LPH

The AHP results in Figure 6 show that the largest service gaps occur in the ASS and RES dimensions, particularly in document completeness (−0.70) and data security (−0.56). Two priority indicators (10 and 15) were identified, emphasizing the need for improvements in information timeliness, service certainty, auditor competence, digital data security, and service accuracy.

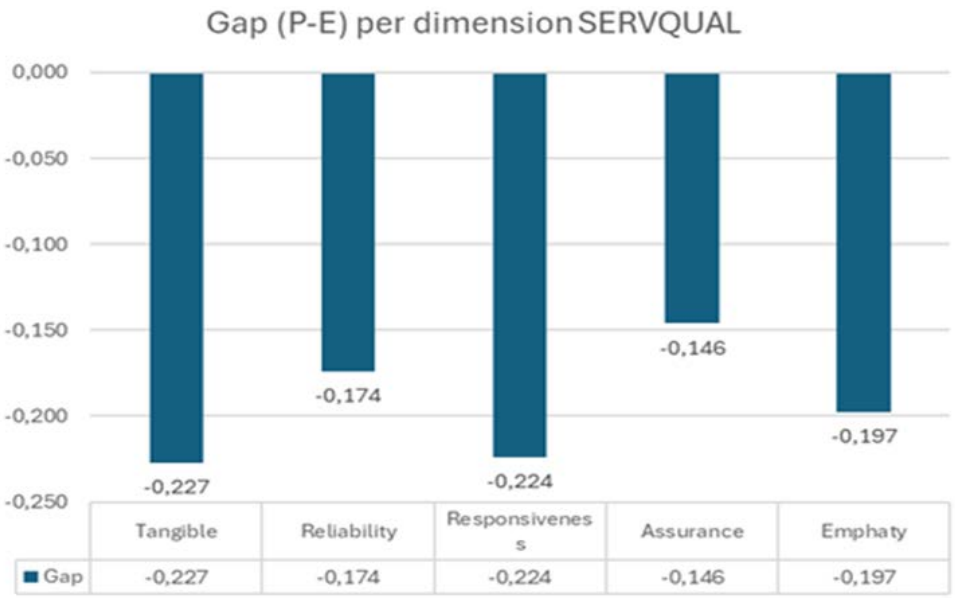

Figure 4. SERVIQUAL dimension gap of halal logistics certification process

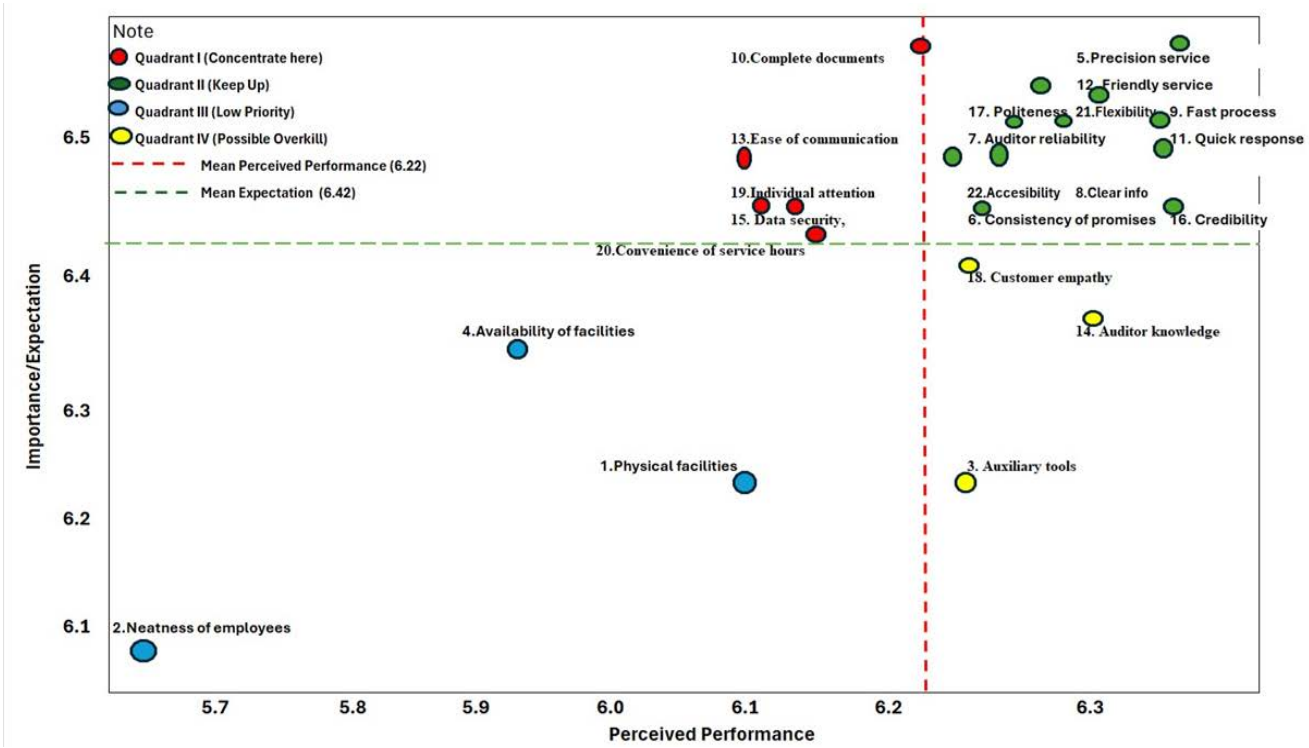

Figure 5. IPA diagram of the SERVQUAL Halal Logistics Certification

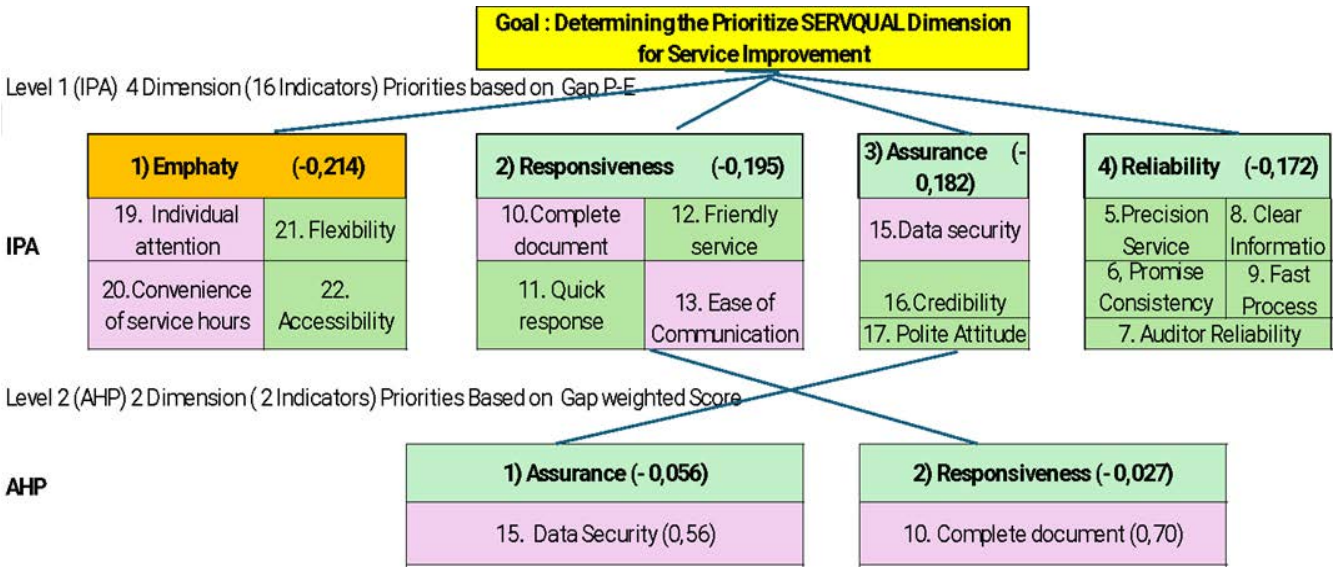

Figure 6. Decision hierarchy to determine which dimension and indicators in SERVQUAL-AHP of halal logistics should be prioritized

The prioritization of two SERVQUAL indicators using the AHP method highlights data security and complete documents as key factors in halal logistics certification services. These findings support the integration of SERVQUAL–AHP to evaluate certification quality (Yusoff, 2024) and aligns with studies emphasizing the importance of responsiveness and service reliability in logistics certification processes (Balaoing-Pelkmans, 2025; Mazuki, 2025). In addition, the need for standardized and expert-driven evaluations of halal certification systems further reinforces the importance of auditor competence and service credibility (Rutkowski, 2025).

Beyond confirming prior studies, the findings show that the dominance of assurance (ASS) and responsiveness (RES) in the AHP weighting is reinforced by the combination of indicator weights located in Quadrant I of the IPA, particularly those related to document completeness and data security, which represent high-importance attributes with relatively lower performances. This concentration of priority indicators within these two dimensions highlights that improvements in certification services should focus on simultaneously strengthening responsiveness and assurance aspects. This indicates that certification services function not only as administrative processes but also as trust-based governance mechanisms that safeguard halal integrity across the supply chain. The significant gaps in these indicators further suggest structural challenges in digital integration and service transparency, highlighting the need to strengthen institutional capacity, digital infrastructure, and auditor competency.

Managerial Implication

The findings indicate that halal logistics certification managers should prioritize auditor and supervisor capability development in completing document during halal manual submission, streamline service processes to reduce delays, reinforce digital security and traceability systems for certification process, and institutionalize SERVQUAL–AHP as a continuous quality control mechanisms to improve customer satisfaction and strengthen industry competitiveness. (Shahruddin & Sarif, 2025) add that halal traceability systems require robust, responsive support from certification bodies, underlining the importance of knowledge and communication accuracy from field officers. The dominance of digital platforms in halal certification, as discussed by Vitkovskyi (2025), raises concerns over system security and digital accuracy, supporting the prioritization of tangible aspects such as system integrity. Similarly, (Sari & Maretasari, 2025), who apply AHP and IPA in service evaluation, emphasize strategic service improvements through measurable performance analysis validating the use of SERVQUAL indicators. Hussain & Shamshudeen (2025) highlight the growing reliance on multi-criteria decision models in halal logistics, while (Idris et al. 2025) mentioned public dissatisfaction due to delays and service inaccuracies, aligning with the prioritization of assurance and responsiveness in the literature.

Lastly, Restuti & Cahya (2025) argue that enhancing competitiveness in halal logistics requires coordinated, competent, and customer-aware service models attributes directly measured through SERVQUAL and ranked using AHP.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study concludes that the effectiveness of halal logistics certification services depends on the integration of responsive human interaction and reliable digital assurance systems. The SERVQUAL–AHP analysis identifies assurance (ASS) and responsiveness (RES) as the most critical dimensions influencing service quality, highlighting the importance of data security and document completeness in halal certification services. Although the CSI reached 89%, the presence of negative service gaps indicates that service improvements remain necessary, particularly for those indicators.

Theoretically, this study extends the application of SERVQUAL–AHP integration to regulated institutional service environments, demonstrating that service quality models commonly applied in commercial services can also be used to evaluate governance-based certification systems, where credibility, compliance, and stakeholder trust are central. Previous logistics service studies have generally emphasized operational dimensions such as responsiveness, reliability, and tangibility as key determinants of service quality in transportation and distribution services (Mentzer et al. 2001; Stank et al. 2003; Thai, 2013). In contrast, certification-based service systems prioritize compliance assurance, such as digital security and institutional responsiveness, to ensure document completeness in halal certification fulfillment.

Recommendations

LPH should prioritize digitally enabled service systems to improve data security, transparency, and responsiveness, including technologies such as blockchain traceability and integrated dashboards, while continuously addressing performance gaps in assurance and responsiveness. Future studies should expand the research scope, involve regulatory experts in AHP weighting, and apply methods such as FGD and system dynamics to strengthen long-term service planning. This study contributes a practical customer satisfaction evaluation framework and enhances the SERVQUAL–AHP model through IPA integration for more accurate service prioritization.

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