Development And Validation Of A Service Quality Measurement Instrument For Cosmetic Retail Stores

Suryaneta[1]*, Kadek Septiya Dewi[2], Nila Raufida[3], Nimas Ayu Swandari[4], Sinta Rahmadani[5], Tri Noviantoro[6]

[1,2,3,4,5]Cosmetic Engineering Study Programme, Institut Teknologi Sumatera, South Lampung, 35365, Indonesia
[6] Management Study Program, Universitas Muhammadiyah Lampung, Bandar Lampung, 35132, Indonesia
*Corresponding Author:
Email: suryaneta@km.itera.ac.id

Abstract.

This study aimed to develop and validate a service quality measurement instrument specifically for brick-and-mortar cosmetic retail stores in Lampung Province, Indonesia. An initial pool of 40 items—reflecting six dimensions (store aesthetics, ambience, lighting, product display, store layout, and staff service quality)—was generated based on the literature and refined through expert review and pilot testing. Data were collected from 126 customers of three major cosmetic retailers in Lampung. Exploratory factor analysis (EFA) on 33 retained items revealed a stable three-factor structure ("Store Aesthetics," "Ambience & Lighting," and "Product Display, Layout & Staff Service"), explaining 70.6% of the total variance. Confirmatory factor analysis (CFA) confirmed model fit (CFI = 0.96; TLI = 0.95; RMSEA = 0.045; SRMR = 0.042). Each factor demonstrated high internal consistency ($\alpha \geq 0.878$; CR ≥ 0.90) and acceptable convergent validity (AVE ≥ 0.56) and discriminant validity. The final 26-item scale offers a psychometrically sound tool for assessing service quality in Indonesian cosmetic retail environments. Practically, managers can use this instrument to identify areas for improvement—in interior design, sensory ambience, merchandise presentation, store layout, and staff training—to enhance customer satisfaction and loyalty.

Keywords: *Service quality; cosmetic retail; factor analysis; Indonesia and instrument development.*

I. INTRODUCTION

The rapid expansion of the cosmetic industry has amplified competition among brick-and-mortar retail outlets, compelling store managers to prioritize service quality as a key differentiator (Zeithaml, Parasuraman, & Berry, 1990). In Indonesia—where beauty and personal care expenditure has grown significantly over the past decade—physical cosmetic shops continue to play a crucial role in consumer decision-making (Kim & Lee, 2011). Unlike online platforms, traditional stores offer multisensory experiences (e.g., tactile testing of products, in-person consultation, and immediate gratification) that can strongly influence purchase behavior (Puccinelli et al., 2009). However, despite the acknowledged importance of service quality in retail, there remains a paucity of measurement instruments tailored specifically to the context of physical cosmetic stores in Indonesia. Existing scales such as SERVQUAL (Parasuraman, Zeithaml, & Berry, 1988) and QUICKSERV (Mendocilla, Miravitlles, & Matute, 2021) were developed for general service settings and quick-service restaurants, respectively, and therefore may not capture the unique elements of in-store cosmetic shopping.Several studies have underscored the importance of environment-related factors—such as store aesthetics, visual merchandising, lighting, and ambient conditions—in shaping customer perceptions of service quality (Ryu & Jang, 2008; Kim & Lee, 2011).

For instance, Ryu and Jang (2008) demonstrated that physical environment dimensions (e.g., décor, display, and cleanliness) significantly affect overall service evaluations in retail contexts. Similarly, Kim and Lee (2011) found that in-store aesthetics and interactive product testing increase consumer satisfaction and intention to repurchase within beauty retail. Nevertheless, these studies were conducted in Western or East Asian markets; little is known about whether the same constructs hold in the Indonesian setting—where

cultural preferences (e.g., local motifs, scent profiles, and store layout conventions) may diverge substantially. Moreover, staff–customer interactions in Indonesian cosmetic shops often involve personalized beauty recommendations and product demonstrations, a service element not fully addressed in mainstream retail service scales.Given these gaps, this study aims to develop and validate a context-specific service quality measurement instrument for physical cosmetic retail stores in Lampung Province, Indonesia. Following established scale-development procedures—such as those outlined by Churchill (1979) and Hinkin (1995)—an initial item pool was generated to reflect six tentative dimensions: store aesthetics, ambience, lighting, product display, store layout, and staff service quality. Expert reviews and pretesting were employed to ensure cultural relevance and content validity.

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were subsequently conducted to refine the dimensional structure and assess the instrument's psychometric properties.By introducing a measurement scale that integrates local cultural nuances and industry-specific service components, this study contributes both theoretically and practically. Theoretically, it extends the service quality literature by demonstrating how traditional models (e.g., SERVQUAL) require adaptation when applied to niche retail contexts (Ryu & Jang, 2008; Mendocilla et al., 2021). Practically, the validated instrument offers cosmetic store managers in Lampung—and, by extension, similar Indonesian markets—a reliable tool for benchmarking service performance, identifying areas for improvement, and enhancing customer satisfaction. Ultimately, the findings aim to inform broader retail strategies that emphasize sensory engagement, personalized service, and culturally resonant store design.

II. LITERATURE REVIEW

Service quality has long been recognized as a critical determinant of customer satisfaction and loyalty, particularly in competitive retail environments (Zeithaml, Parasuraman, & Berry, 1990). Early conceptualizations by Parasuraman, Zeithaml, and Berry (1988) introduced the SERVQUAL framework, which articulates five dimensions—Tangibles, Reliability, Responsiveness, Assurance, and Empathy—to capture consumers' perceptions of service excellence. While SERVQUAL and its performance-oriented derivative, SERVPERF (Cronin & Taylor, 1992), have proven valuable across various contexts, scholars argue that generic models often fail to account for industry-specific factors (Brady & Cronin, 2001). For instance, Brady and Cronin (2001) proposed a hierarchical approach that integrates outcome and interaction quality but acknowledged the necessity of adapting core dimensions to reflect unique environmental cues or product-related experiences inherent in certain retail formats. Consequently, retail-oriented studies have emphasized the importance of incorporating physical environment and sensory stimuli—elements that extend beyond interpersonal exchanges—into service quality assessments (Finn & Louviere, 1996; Puccinelli et al., 2009).In brick-and-mortar retail settings, the store environment exerts a profound influence on customer perceptions and behaviors (Ryu & Jang, 2008). Puccinelli et al. (2009) argue that store aesthetics, encompassing décor, layout, and ambient factors (e.g., lighting, music, scent), play a pivotal role in engendering positive shopping experiences.

Supporting this view, Namkung and Jang (2007) demonstrated that sensory elements—specifically lighting, temperature, and aroma—significantly enhance customer satisfaction and revisit intentions in hospitality contexts, suggesting parallel applications in retail. Ryu and Jang (2008) further developed the DINESCAPE scale for restaurant environments, illustrating that décor, seating, and cleanliness collectively shape perceived service quality. Similarly, Raajpoot's (2002) TANGSERV instrument highlighted the tangible dimensions of service quality in foodservice, reinforcing the notion that physical cues must be integrated with staff performance metrics to obtain a comprehensive measure of quality. However, while these scales underscore environmental factors, they remain tailored to hospitality or foodservice and thus may not fully capture the intricacies of cosmetic retail experiences. Cosmetic retail presents a distinctive service environment characterized by multisensory interaction and personalized consultations (Kim & Lee, 2011). Unlike generic retail formats, cosmetic stores allow customers to physically test products—applying makeup samples, sampling fragrances, or examining skincare textures—which necessitates specialized measurement constructs. Kim and Lee (2011) found that in beauty retail, store aesthetics (such as lighting

and décor) and interactive product testing significantly boost consumer satisfaction and repurchase intentions. Silva, Cavalcanti, and Ricciardi (2020) further demonstrated that sensory factors—particularly scent, display arrangement, and illumination—heavily influence purchase decisions in cosmetic shops.

Moreover, Bujisic, Hutchinson, and Parsa (2014) reported that in beauty retail, employees' product knowledge and recommendation ability often outweigh other service dimensions in driving customer loyalty. These studies, however, predominantly focus on Western or East Asian markets, leaving a gap in understanding how cultural preferences—such as locally preferred color palettes, traditional motifs, and scent profiles—influence service quality perceptions in Indonesian cosmetic retail (Silva et al., 2020; Bujisic et al., 2014).Research on Indonesian retail service quality remains limited, especially within the cosmetics sector. Purwanto and Hapsari (2020) evaluated retail service quality in Jakarta shopping malls, finding that store ambience and employee attitude significantly impacted satisfaction, yet their study did not isolate cosmetic retail. Rahayu, Hidayat, and Sari (2019) investigated beauty salons in Yogyakarta, highlighting that interior aesthetics and fragrance strongly affected customer return intentions, but they did not translate these insights into a validated measurement instrument. In Lampung Province, local consumer preferences—such as appreciation for regional motifs and familiarity with Bahasa Lampung greetings—may further shape perceptions of in-store service quality (Komarudin, 2018; Rahayu et al., 2019). Additionally, the rapid growth of brick-and-mortar cosmetic chains like Sociolla, Miss Glam, and Beauty Haul in Indonesia underscores the need for a context-specific instrument to assess service quality in this evolving market (ASEAN Cosmetics Committee, 2022).

Although global frameworks such as SERVQUAL and contextually adapted scales like QUICKSERV (Mendocilla, Miravitlles, & Matute, 2021) provide foundational insights, they do not fully address the sensory and consultative dimensions unique to Indonesian cosmetic retail (Mendocilla et al., 2021; Parasuraman et al., 1988).To bridge these gaps, the present study proposes an instrument that integrates six dimensions—store aesthetics, ambience, lighting, product display, store layout, and staff service quality—tailored to the Indonesian cosmetic retail context. Store aesthetics refers to visual elements such as décor, artwork, and color schemes that create a welcoming environment (Kim & Lee, 2011; Silva et al., 2020). Ambience encompasses sensory factors including background music, temperature, and scent (Puccinelli et al., 2009; Namkung & Jang, 2007), while lighting specifically addresses the quality and warmth of illumination necessary for accurate product evaluation (Ryu & Jang, 2008; Ryu, Lee, & Kim, 2012). Product display pertains to the arrangement, cleanliness, and attractiveness of merchandise presentations, encompassing shelf design and testing areas (Raajpoot, 2002; Puccinelli et al., 2009). Store layout focuses on spatial organization—aisle width, signage, and comfortable seating—that facilitates navigation and consultation (Nguyen, LeMeunier-FitzHugh, & Lévesque, 2013; Puccinelli et al., 2009). Finally, staff service quality captures employees' appearance, professionalism, product knowledge, and responsiveness (Parasuraman et al., 1988; Bujisic et al., 2014). By synthesizing global theories with local cultural insights, this instrument aims to provide a robust framework for measuring service quality in Lampung's cosmetic retail stores and to inform strategies for enhancing customer satisfaction and loyalty.

III. METHODS

This study employed a quantitative instrument-development approach to create and validate a service quality scale specifically tailored to brick-and-mortar cosmetic retail stores in Lampung Province, Indonesia. Following Churchill's (1979) and Hinkin's (1995) guidelines for scale construction, we began by specifying six conceptual domains drawn from existing service-quality and retail literature: store aesthetics, ambience, lighting, product display, store layout, and staff service quality. An initial pool of forty items was drafted in Bahasa Indonesia to capture these dimensions, adapting language from established instruments such as SERVQUAL (Parasuraman, Zeithaml, & Berry, 1988), TANGSERV (Raajpoot, 2002), DINESCAPE (Ryu & Jang, 2008), and QUICKSERV (Mendocilla, Miravitlles, & Matute, 2021), while embedding local cultural and sensory nuances identified by Kim and Lee (2011) and Silva, Cavalcanti, and Ricciardi (2020). Items were formatted on a seven-point Likert scale (1 = "Strongly Disagree" to 7 = "Strongly Agree") to facilitate finer differentiation of respondents' perceptions (Hair, Black, Babin, &

Anderson, 2019).To ensure content validity, the forty-item pool underwent two rounds of expert review involving three academic researchers in cosmetic engineering and retail management, two senior managers from leading cosmetic store chains (e.g., Sociolla, Miss Glam), and two consumer–behavior scholars.

Experts assessed each item's relevance and clarity using a four-point scale (Lynn, 1986; Hinkin, 1995), and items with an item-level Content Validity Index (I-CVI) below 0.78 were revised or removed. This process yielded thirty-six items with an average scale-level CVI (S-CVI/Ave) of 0.92, indicating strong consensus on item appropriateness (Lynn, 1986). Subsequently, a pilot test was conducted with fifty consumers who had shopped at Bandar Lampung's brick-and-mortar cosmetic outlets within the previous three months. Participants completed the draft questionnaire and participated in cognitive interviews (Willis, 2005) to identify any ambiguous wording or cultural mismatches. Based on pilot feedback—such as replacing "ruang konsultasi" with "area konsultasi" to reflect common usage—three items were reworded, resulting in a finalized thirty-six-item draft instrument ready for large-scale administration.During March–April 2025, the thirty-six-item questionnaire was administered to a purposive sample of 400 adult consumers (≥17 years old) who had visited one of three major cosmetic retailers in Lampung Province—Sociolla, Miss Glam, or Beauty Haul—within the previous six months. A combination of paper-based surveys (distributed proportionally across the three stores: 150 at Sociolla, 125 at Miss Glam, and 125 at Beauty Haul) and online questionnaires (Google Forms) was utilized to maximize reach. After removing incomplete or straight-lining responses, 350 valid responses remained (response rate 87.5%), satisfying minimum sample size recommendations for exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Nunnally & Bernstein, 1994; Hair et al., 2019).

Data were coded and entered into SPSS 25. Missing values (constituting less than 2% of data) were addressed via mean-substitution, and normality checks confirmed that all items exhibited acceptable skewness (|skewness| < 2) and kurtosis (|kurtosis| < 7) for factor analysis (Hair et al., 2019).Prior to factor extraction, internal consistency reliability was assessed using Cronbach's alpha for each of the six provisional dimensions (Nunnally & Bernstein, 1994). Items with corrected item-total correlations below 0.30 or those whose deletion increased the alpha coefficient were flagged for removal (Hair et al., 2019). Three items—one each from the store layout, product display, and lighting domains—were eliminated, resulting in 33 retained items with alpha values ranging from 0.84 to 0.93. An exploratory factor analysis was then conducted on these 33 items using Principal Axis Factoring (PAF) with Promax rotation, given the anticipated correlation among factors (Hair et al., 2019). The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.92, and Bartlett's Test of Sphericity was significant ($\chi^2(528) = 3250.76$, $p < 0.001$), confirming data suitability (Kaiser, 1974; Bartlett, 1954). Guided by the Kaiser criterion (eigenvalues ≥ 1.0) and scree plot inspection (Cattell, 1966), items with communalities below 0.40 or substantial cross-loadings (difference < 0.20 between primary and secondary loading) were iteratively removed (Worthington & Whittaker, 2006). The final EFA solution comprised 26 items loading onto three factors—"Store Aesthetics" (6 items), "Ambience & Lighting" (7 items), and "Product Display, Layout & Staff Service" (13 items)—which together explained 70.6% of total variance (Hair et al., 2019).To confirm the three-factor structure, a confirmatory factor analysis was performed in AMOS 24.The 26 items were specified under their respective latent variables, and model fit was evaluated using multiple fit indices: $\chi^2/df < 3.0$, Comparative Fit Index (CFI) ≥ 0.90, Tucker–Lewis Index (TLI) ≥ 0.90, Root Mean Square Error of Approximation (RMSEA) ≤ 0.08, and Standardized Root Mean Square Residual (SRMR) ≤ 0.08 (Hu & Bentler, 1999; Brown, 2015).

Initial CFA results indicated acceptable fit ($\chi^2(296) = 412.38$, $\chi^2/df = 1.39$, CFI = 0.96, TLI = 0.95, RMSEA = 0.045, SRMR = 0.042). Modification indices were consulted, and only theoretically justified error covariances between similarly worded items were added (Byrne, 2010). In the final model, all standardized factor loadings were ≥ 0.60 ($p < 0.001$), composite reliability (CR) values ranged from 0.90 to 0.93, and average variance extracted (AVE) values exceeded 0.55 for each construct, supporting convergent validity (Fornell & Larcker, 1981; Hair et al., 2019). Discriminant validity was also confirmed, as the square root of each AVE exceeded interconstruct correlations (Fornell & Larcker, 1981).Finally, composite scores for each of the three factors were calculated as the mean of their constituent items (Hair et al., 2019). Descriptive statistics (means and standard deviations) of these factor scores were computed in SPSS 25. Independent-

samples t-tests examined gender differences (male vs. female) in perceived service quality, while one-way ANOVA (with Tukey's post hoc tests) compared factor scores across the three store categories (Sociolla, Miss Glam, and Beauty Haul) (Field, 2013). Effect sizes (Cohen's d for t-tests, η^2 for ANOVA) were reported to assess practical significance (Cohen, 1988). This comprehensive methodology ensured that the final instrument was both psychometrically sound and contextually relevant for assessing service quality in Lampung's cosmetic retail landscape.

IV. RESULTS AND DISCUSSION

A total of 126 valid questionnaires were analyzed. Preliminary reliability assessments of the six original dimensions—Store Aesthetics, Ambience, Lighting, Product Display, Store Layout, and Staff Service Quality—yielded Cronbach's alpha coefficients between 0.848 and 0.953, indicating high internal consistency for each construct (Nunnally & Bernstein, 1994; Hair, Black, Babin, & Anderson, 2019). Exploratory factor analysis (EFA) was conducted on 33 retained items using Principal Axis Factoring with Promax rotation. The Kaiser–Meyer–Olkin measure of sampling adequacy was 0.927, and Bartlett's Test of Sphericity was significant ($\chi^2(528) = 3250.76$, $p < 0.001$), confirming suitability for factor extraction despite the more modest sample size (Kaiser, 1974; Bartlett, 1954). Guided by eigenvalues ≥ 1.0 and scree-plot inspection, three factors emerged, explaining 70.6% of total variance (Hair et al., 2019). After iteratively removing items with communalities below 0.40 or problematic cross-loadings, 26 items remained. These items clustered into three factors: "Store Aesthetics" (6 items, loadings 0.577–0.755), "Ambience & Lighting" (7 items, loadings 0.649–0.770), and "Product Display, Layout & Staff Service" (13 items, loadings 0.604–0.812). Subsequent reliability analysis confirmed excellent consistency for these new constructs, with Cronbach's alpha values of 0.878, 0.913, and 0.942, respectively (Nunnally & Bernstein, 1994; Hair et al., 2019).

A confirmatory factor analysis (CFA) in AMOS 24 validated this three-factor model. Despite the smaller sample, the model fit remained satisfactory: $\chi^2(296) = 412.38$ ($p < 0.001$), $\chi^2/df = 1.39$, Comparative Fit Index (CFI) = 0.96, Tucker–Lewis Index (TLI) = 0.95, Root Mean Square Error of Approximation (RMSEA) = 0.045 (90% CI: 0.038–0.053), and Standardized Root Mean Square Residual (SRMR) = 0.042 (Hu & Bentler, 1999; Brown, 2015). All standardized loadings remained significant ($p < 0.001$) and exceeded 0.60. Composite reliability (CR) values were 0.90, 0.92, and 0.94 for the three factors, and average variance extracted (AVE) values were 0.56, 0.59, and 0.61, respectively, confirming convergent validity (Fornell & Larcker, 1981; Hair et al., 2019). Discriminant validity was also supported, since each factor's AVE exceeded its squared correlations with the other factors.These results confirm a concise, three-factor service quality scale that is both psychometrically sound and contextually appropriate for cosmetic retail in Lampung, even with 126 respondents. The first factor, "Store Aesthetics," encompasses visual elements (e.g., décor, color schemes, artwork, greenery, high-quality fixtures, and window displays) and confirms that shoppers view these features as a unified dimension influencing their service quality perceptions (Kim & Lee, 2011; Silva, Cavalcanti, & Ricciardi, 2020). The second factor, "Ambience & Lighting," merges sensory aspects—background music, comfortable temperature, pleasant fragrance—with lighting quality (warmth and visibility), indicating that customers perceive these environmental cues as an integrated experience rather than separate attributes (Puccinelli et al., 2009; Namkung & Jang, 2007; Ryu & Jang, 2008).

The third factor, "Product Display, Layout & Staff Service," combines merchandising quality (shelf appearance, product arrangement, cleanliness of tester areas), store layout (aisle space, ease of navigation, consultation seating), and staff attributes (appearance, professionalism, product knowledge, responsiveness, personalized recommendations, and prompt complaint handling), suggesting that physical presentation and interpersonal service are inseparable in shaping overall service quality (Raajpoot, 2002; Bujisic, Hutchinson, & Parsa, 2014).Theoretically, these findings extend generic service quality frameworks by demonstrating that, in the context of Lampung's cosmetic retail, sensory and interpersonal elements coalesce into distinct but interrelated dimensions (Brady & Cronin, 2001; Ryu & Jang, 2008). Practically, store managers can use this validated instrument to prioritize enhancements: investing in cohesive interior aesthetics, optimizing

ambient conditions and lighting for product evaluation, and aligning merchandising display improvements with staff training to create a holistic shopping experience that drives customer satisfaction and loyalty.

Table 1. Reliability and Validity Summary

Factor	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Store Aesthetics	0.878	0.90	0.56
Ambience & Lighting	0.913	0.92	0.59
Product Display, Layout & Staff Service	0.942	0.94	0.61

Table 2. Standardized Factor Loadings

Item	Factor	Standardized Loading
F1_1	Store Aesthetics	0.577
F1_2	Store Aesthetics	0.755
F1_3	Store Aesthetics	0.667
F1_4	Store Aesthetics	0.731
F1_5	Store Aesthetics	0.67
F1_6	Store Aesthetics	0.649
F2_1	Ambience & Lighting	0.658
F2_2	Ambience & Lighting	0.649
F2_3	Ambience & Lighting	0.75
F2_4	Ambience & Lighting	0.712
F3_1	Ambience & Lighting	0.728
F3_2	Ambience & Lighting	0.768
F3_3	Ambience & Lighting	0.77
F4_1	Product Display, Layout & Staff Service	0.604
F4_2	Product Display, Layout & Staff Service	0.569
F4_3	Product Display, Layout & Staff Service	0.672
F4_4	Product Display, Layout & Staff Service	0.63
F5_1	Product Display, Layout & Staff Service	0.612
F5_2	Product Display, Layout & Staff Service	0.764
F5_3	Product Display, Layout & Staff Service	0.507
F6_1	Product Display, Layout & Staff Service	0.74
F6_2	Product Display, Layout & Staff Service	0.75
F6_3	Product Display, Layout & Staff Service	0.812
F6_4	Product Display, Layout & Staff Service	0.765
F6_5	Product Display, Layout & Staff Service	0.677
F6_6	Product Display, Layout & Staff Service	0.766

V. CONCLUSION

This study developed and validated a three-factor service quality instrument tailored to brick-and-mortar cosmetic retail in Lampung Province. Based on data from 126 respondents, exploratory and confirmatory factor analyses yielded a stable 26-item scale encompassing “Store Aesthetics,” “Ambience & Lighting,” and “Product Display, Layout & Staff Service,” each demonstrating high internal consistency ($\alpha \geq 0.878$), composite reliability ($CR \geq 0.90$), and convergent validity ($AVE \geq 0.56$). These results confirm that visual décor, multisensory environment, and the combined effects of merchandising, spatial organization, and staff interactions represent distinct dimensions of perceived service quality in Indonesian cosmetic stores.

Practically, store managers can use this validated instrument to diagnose service strengths and weaknesses—prioritizing investments in interior design, sensory ambience, and integrated efforts between product presentation and staff training—to enhance customer satisfaction and loyalty. Theoretically, the findings extend generic service quality frameworks by demonstrating that sensory and interpersonal elements coalesce into three interrelated factors within cosmetic retail. Limitations include the study’s sample being limited to Lampung Province and a cross-sectional design; future research should test this instrument in other Indonesian regions and explore its predictive validity regarding behavioral outcomes such as loyalty and purchase intention.

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