World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

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Integrating Kansei Engineering and Importance Performance Analysis as a Framework for Café Service Quality Evaluation

Heru Prastawa, Dava Gilang Erta Kayla and Dhimas Wachid Nur Saputra *

Department of Industrial Engineering, Diponegoro University, Semarang, Indonesia.

World Journal of Advanced Research and Reviews, 2025, 28(03), 267–274

Publication history: Received on 26 October 2025; revised on 30 November 2025; accepted on 03 December 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.28.3.4061

Abstract

This study aims to evaluate the service quality of a café by considering customers' emotional perceptions and satisfaction through the integration of Kansei Engineering (KE) and Importance Performance Analysis (IPA). Kansei words were identified from literature references and validated by experts to ensure their relevance to service attributes, while data were collected from 99 customer respondents using questionnaires measuring importance and performance levels. The IPA analysis revealed several attributes located in Quadrant I (priority for improvement), including staff responsiveness, environmental safety, food and beverage hygiene, staff attentiveness during peak hours, and transaction security. The findings highlight that the integration of KE and IPA can serve as a systematic evaluation tool for mapping service attributes based on emotional perceptions and performance gaps, enabling managers to identify priority areas for improvement and design more targeted strategies. Academically, this study contributes to the advancement of emotion-based methodologies in service quality evaluation, while practically offering a framework to enhance customer satisfaction, foster loyalty, and strengthen competitive advantage.

Keywords: Importance Performance Analysis (IPA); Kansei Engineering (KE); Customer satisfaction; Emotional perceptions

1. Introduction

Competition in the business landscape has become increasingly intense across various sectors, including the Food and Beverage (FnB) industry. Within this context, cafés have emerged as a rapidly growing form of FnB enterprise. Characterized as small-scale restaurants with a limited number of service tables, cafés function not only as dining venues but also as social spaces frequently utilized for working and socializing [1]. This characteristic implies that customer satisfaction is determined not only by preferences and needs related to product quality but also by the quality-of-service delivery [2]. Consequently, businesses are required to be more responsive to customer feedback and complaints to maintain service quality, enhance customer satisfaction, and foster loyalty [3], [4].

Customer feedback and complaints often reflect emotional responses toward the services provided. Emotional analysis can serve as a valuable tool for evaluating service quality [5]. To systematically capture these emotions, a methodological approach is needed that connects customers' psychological perceptions with service evaluation. This study focuses on integrating Kansei Engineering (KE) and Importance Performance Analysis (IPA) to evaluate and improve café service quality through customer emotional perceptions. Kansei Engineering (KE) is a methodological tool that translates customers' impressions and emotions regarding a product or service into design elements [6]. The term "Kansei," derived from Japanese, refers to the psychological feelings of customers toward products or services [2]. These psychological feelings encompass auditory, olfactory, gustatory, and visual perceptions [7]. In this study, the output of the Kansei Engineering model, expressed in kansei words, is utilized as input for mapping service improvement

* Corresponding author: Dhimas Wachid Nur Saputra

priorities and evaluating service performance. The prioritization process is conducted using Importance Performance Analysis (IPA), which maps customer evaluations across various service attributes [8].

Previous studies have applied Kansei Engineering to service quality evaluation in diverse sectors, including hotels, service companies, restaurants, hospitals, and airlines. However, most prior research integrated KE with other models such as Kano or Quality Function Deployment (QFD). In contrast, the specific integration of KE and IPA within the café context remains limited. This highlights a research gap that the present study aims to address. Through the integration of these two approaches, this study not only identifies customers' impressions and emotional responses toward services but also formulates more targeted improvement strategies based on the importance and performance levels of each attribute. Consequently, the proposed model is expected to provide significant contributions, both academically in advancing emotion-based service evaluation methodologies and practically in assisting café managers to enhance service quality and strengthen customer loyalty.

2. Material and methods

This study focuses on the integration of Kansei Engineering (KE) and Importance Performance Analysis (IPA) in evaluating service quality at a café in Semarang City. The integration of these two methods was applied empirically through questionnaire-based data collection, enabling the identification of service attributes and kansei words that represent customers' emotional perceptions. The entire research process is systematically illustrated in Figure 1.

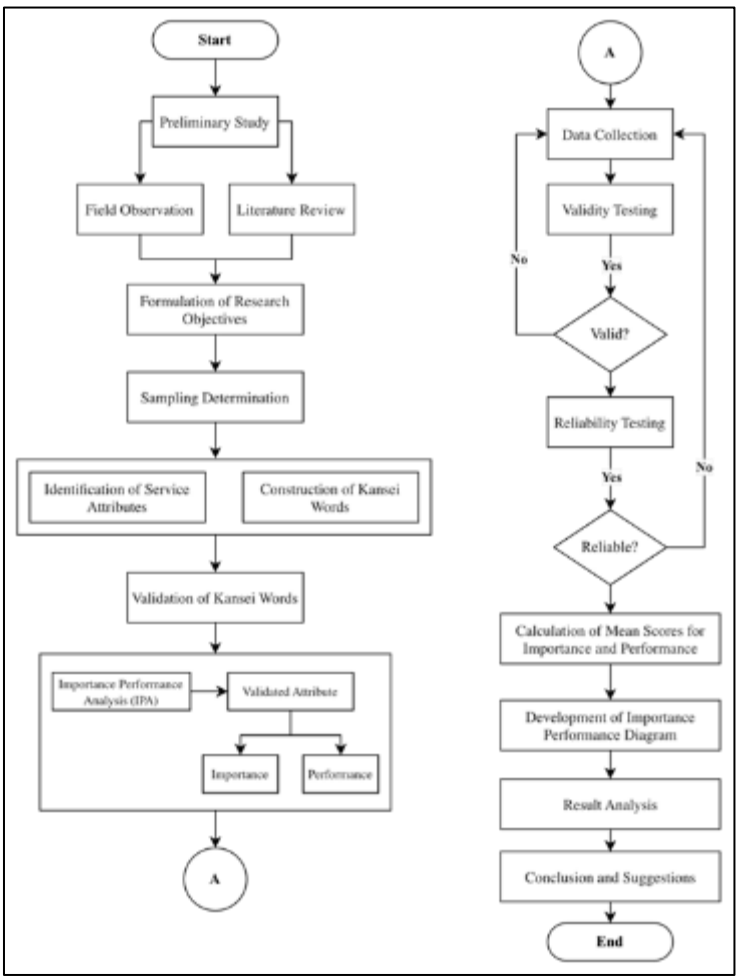

Figure 1 Research Flow

The research stages began with a preliminary study, consisting of field observations and literature review, to formulate more specific research objectives. Subsequently, the sample size was determined using a purposive sampling approach, resulting in 97 respondents. The research instrument, in the form of a questionnaire, was developed based on relevant service attributes and kansei words adapted from literature studies and field exploration. Prior to the main analysis, the questionnaire was tested for validity and reliability to ensure its feasibility. Validity testing was conducted by measuring

item-total correlations, while reliability was assessed using Cronbach's Alpha with a minimum threshold of 0.60 as the acceptance criterion. The results confirmed that the instrument met both validity and reliability requirements, making it suitable for subsequent analysis. The validated data were then utilized to identify service attributes and construct kansei words. Relevant service attributes were further analyzed using the IPA approach, which maps the importance and performance levels of each attribute based on customer perceptions. The integration with KE was conducted to link service attributes with customers' emotional responses, thereby providing a comprehensive overview of café service quality.

3. Results and discussion

3.1. Kansei Word

Based on the identification process, a total of 16 kansei words were selected to evaluate the café's service quality. These kansei words were derived from previous research literature relevant to service contexts and subsequently validated through expert relevance testing. The validation process was intended to ensure that the selected kansei words accurately represent customers' emotional perceptions of the service attributes offered. In this study, the validation was conducted by three experts, all of whom are academics with recognized expertise in industrial engineering, thereby ensuring objectivity and methodological rigor in the selection process. The results confirmed that the chosen kansei words exhibit a high degree of relevance to the observed service attributes, making them a reliable analytical instrument. Consequently, the integration of kansei words with the Importance Performance Analysis approach enables a more comprehensive evaluation, capturing not only importance and performance dimensions but also the emotional responses of customers. Table 1 presents the validated service attributes alongside the selected kansei words.

Table 1 Kansei Word

No	Attribute	Kansei Word
1	Overall cleanliness and lighting of the café	Comfortable, Beautiful
2	Café staff provide clear information to customers regarding order time	Helpful, Trustworthy
3	Café staff are responsive to customer needs and requests	Responsive, Attentive
4	The café provides a safe environment	Comfortable, Safe
5	Café staff demonstrate reliability in handling complaints	Professional, Trustworthy
6	Readiness of café staff in serving customers	Friendly, Professional
7	The café maintains cleanliness and freshness of food and beverages	Clean, Safe
8	Patience of café staff in serving customers	Patient, Kind
9	Attractive and calming café design	Aesthetic, Relaxing
10	The café plays pleasant background music creating engaging atmosphere	Engaging, Cheerful
11	Café staff maintain neat appearance	Professional, Fresh
12	The café provides consistent service during peak and non-peak hours	Good, Fast
13	Availability of supporting facilities (clean toilets, parking, Wi-Fi)	Effective, Comfortable
14	When all tables are occupied, café staff show care for customer comfort	Caring, Comfortable
15	Transaction processes are safe and error-free	Safe, Honest
16	Café staff show personal attention through greetings and courtesies	Caring, Attentive

3.2. Respondent Characteristics and Instrument Validation

The presentation of respondent characteristics provides an essential context for interpreting the study's findings. Most respondents were young, productive-age females (17–30 years old), with most being first-time visitors to the café. This demographic profile highlights the strategic importance of initial service quality in shaping customer satisfaction and loyalty, thereby reinforcing the relevance of integrating Kansei Engineering and Importance Performance Analysis to

evaluate emotional impressions and identify service attributes most influential to customer experience. Table 2 provides an overview of the respondents' characteristics in this research.

Table 2 Respondent Characteristics

Characteristic		**Total**	**Percentage**
Gender	Male	30	30.3%
	Female	69	69.7%
Age	17 - 20 years old	37	62.6%
	21- 30 years old	62	37,4%
	≥ 31 years old	-	-
Frequency of Visits	One Time	65	65.7%
	2-3 Times	26	26.3%
	More than 3 times	8	8.1%

In addition to respondent characteristics, the research instrument was tested for validity and reliability, as presented in Table 3. The validity test results confirmed that all questionnaire items met the correlation coefficient (r) criteria, thereby establishing their validity. The reliability test produced Cronbach's Alpha values exceeding the minimum threshold of 0.60, with 0.766 for the importance category and 0.769 for the performance category. These values demonstrate strong internal consistency and affirm the instrument's suitability for subsequent analysis.

Table 3 Validity Test Results

No	**calculated correlation coefficient (r) for importance**	**calculated correlation coefficient (r) for correlation criteria**	**r Table**	**Validity**
1	0.748	0.765	0.198	Valid
2	0.678	0.796	0.198	Valid
3	0.725	0.811	0.198	Valid
4	0.698	0.752	0.198	Valid
5	0.766	0.736	0.198	Valid
6	0.783	0.795	0.198	Valid
7	0.796	0.766	0.198	Valid
8	0.771	0.814	0.198	Valid
9	0.715	0.785	0.198	Valid
10	0.688	0.774	0.198	Valid
11	0.740	0.829	0.198	Valid
12	0.750	0.761	0.198	Valid
13	0.734	0.671	0.198	Valid
14	0.763	0.834	0.198	Valid
15	0.740	0.737	0.198	Valid
16	0.763	0.797	0.198	Valid

3.3. Importance Performance Analysis (IPA)

Based on the identification process, a total of 16 kansei words were selected to evaluate the café's service quality. These kansei words were derived from previous research literature relevant to service contexts and subsequently validated through expert relevance testing. The validation process was intended to ensure that the selected kansei words accurately represent customers' emotional perceptions of the service attributes offered. The following stage focuses on the mapping of Importance Performance Analysis (IPA). This process utilizes the mean scores of importance and performance to capture customer perceptions of each service attribute across both dimensions. The mean importance score reflects how essential a service attributes is to customers, while the mean performance score indicates the level of customer satisfaction with the services provided by the café. These calculated values serve as the primary input for the IPA mapping. The average scores of importance and performance derived from the questionnaire are presented in Table 4.

Table 4 Mean Scores of Importance and Performance

No	Mean Score of Importance	Mean Score of Performance
1	4.515	3.980
2	4.404	3.808
3	4.535	3.889
4	4.505	3.960
5	4.455	4.010
6	4.455	3.889
7	4.566	3.899
8	4.475	3.889
9	4.263	3.737
10	4.172	3.717
11	4.384	3.788
12	4.414	3.636
13	4.495	3.717
14	4.475	3.879
15	4.525	3.990
16	4.404	3.859

Figure 2 illustrates the mapping results of the Importance Performance Analysis (IPA) diagram, which serves as a methodological tool to identify service attributes requiring evaluation and improvement. Within this framework, the level of importance of each attribute is systematically compared with the performance perceived by customers, thereby revealing the extent to which service delivery aligns with customer expectations. The outcomes of the IPA analysis are subsequently plotted into four quadrants, each representing a distinct strategic category. This quadrant-based mapping is particularly significant because it provides managers with clear and actionable insights, enabling them to formulate service quality enhancement strategies that are both targeted and efficient. In essence, IPA functions not only as an evaluative instrument but also as a strategic framework that bridges customer perceptions with managerial decision-making, ultimately supporting efforts to strengthen satisfaction, loyalty, and competitive advantage.

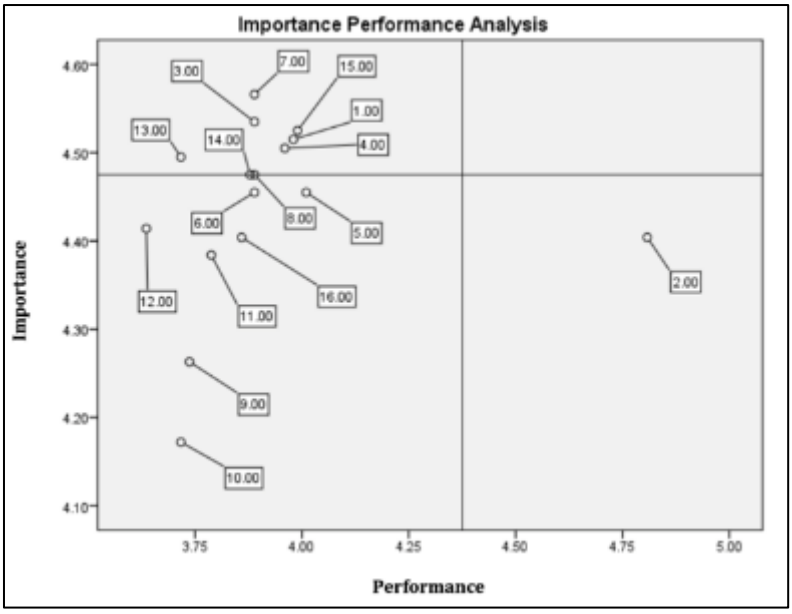

Figure 2 Importance Performance Analysis

3.3.1. Quadrant I

Quadrant I comprises service attributes that customers perceive as highly important but whose performance remains below expectations, thereby creating a gap between expectation and reality [9]. The attributes in this quadrant include comfort derived from cleanliness and lighting (Q1), which significantly affects emotional experiences [10]; staff responsiveness (Q3) [11], shown to enhance loyalty; environmental safety (Q4), contributing to comfort and trust [12]; cleanliness and freshness of food and beverages (Q7), directly linked to health and customer trust [13]; effectiveness of supporting facilities such as toilets, parking, and Wi-Fi (Q13), influencing emotional satisfaction [14]; staff attentiveness during crowded conditions (Q14), which shapes customer experience; and transaction safety (Q15), reinforcing trust and service image. These attributes play a critical role in shaping customer satisfaction as they are directly associated with emotions such as comfort, safety, appreciation, trust, and assurance. If left unaddressed, these gaps may generate negative emotions such as, discomfort, neglect, doubt, or loss of trust that reduce satisfaction and weaken loyalty. Conversely, improving performance in these attributes fosters positive impressions, strengthens perceived service quality, enhances affective satisfaction, and promotes long-term customer loyalty while reinforcing the café's positive image.

3.3.2. Quadrant II

Quadrant II comprises service attributes characterized by both high importance and high performance. This condition indicates that these attributes are perceived as highly significant by customers and their performance has successfully met, or nearly met, customer expectations [9]. Maintaining quality in these attributes is crucial, as any decline in performance may directly reduce customer satisfaction and loyalty. Nevertheless, the IPA mapping results reveal that no service attributes are positioned in Quadrant II (Maintain Performance). This finding suggests that although several attributes are considered important, their performance has not fully met customer expectations. In other words, none of the attributes have reached the ideal position capable of delivering maximum satisfaction in line with their level of importance.

3.3.3. Quadrant III

Quadrant III comprises service attributes with both low importance and low performance [9]. These aspects are not considered primary priorities since customers place limited expectations on them, yet maintaining their quality remains essential to avoid negative perceptions. The attributes in this quadrant include staff professionalism in handling complaints (Q5), readiness to serve (Q6), patience (Q8), relaxing café design (Q9), cheerful background music (Q10), neat staff appearance (Q11), service speed (Q12), and personal greetings (Q16). These factors contribute to positive emotional experiences such as comfort, appreciation, relaxation, and trust, even though they are not the core determinants of satisfaction.

Prior studies highlight that professionalism and readiness influence satisfaction [15], patience and interaction foster loyalty [16], design and atmosphere enhance comfort [12], staff appearance conveys professionalism, service speed affects perceived satisfaction [17], and personal greetings strengthen emotional closeness [18]. In short, while these attributes are of lower priority, consistent management is still required. Neglecting them may generate negative emotions such as disappointment or lack of appreciation, whereas gradual improvement reinforces the café's positive image, sustains emotional satisfaction, and promotes long-term loyalty.

3.3.4. Quadrant IV

Quadrant IV consists of attributes perceived as low in importance but high in performance. This condition indicates that the company places excessive attention on aspects that are not strongly expected by customers. In other words, although execution is optimal, its impact on satisfaction is limited since these attributes are not primary priorities. The attribute in this quadrant is staff assistance in providing clear information regarding order serving time or service processes (Q2). Emotionally, clarity of information fosters feelings of being helped, appreciated, and trusted, particularly among customers who value certainty. However, the low importance score suggests that most customers are satisfied without detailed explanations, as long as service delivery remains fast and accurate.

The results of the Importance Performance Analysis (IPA) underscore the necessity of prioritizing attributes located in Quadrant I, as these dimensions exert a direct and substantial influence on customer satisfaction and loyalty. Simultaneously, attributes situated in Quadrants III and IV require consistent management to preserve a favorable service image and sustain long-term emotional engagement, even though their relative importance is lower. The absence of attributes in Quadrant II further reveals that the current level of service performance has not yet attained the ideal balance between importance and execution, thereby highlighting the imperative of continuous improvement. Accordingly, the IPA mapping should be regarded not merely as an evaluative instrument, but as a strategic framework that enables organizations to formulate targeted, efficient, and customer-oriented policies for service quality enhancement, ultimately reinforcing both satisfaction and loyalty in a sustainable manner.

4. Conclusion

This study demonstrates that the integration of Kansei Engineering (KE) and Importance Performance Analysis (IPA) provides a comprehensive framework for evaluating service quality through customers' emotional perceptions. The IPA mapping into four quadrants revealed attributes requiring immediate improvement (Quadrant I), the absence of attributes in the ideal position of simultaneously high importance and performance (Quadrant II), attributes of lower importance that nonetheless demand consistent management (Quadrant III), and attributes of low importance but high performance, reflecting excessive managerial attention (Quadrant IV).

Overall, the findings emphasize that service quality improvement strategies should be concentrated on Quadrant I attributes, while maintaining consistency in Quadrants III and IV. The lack of attributes in Quadrant II indicates that service performance has not yet reached the optimal balance, underscoring the necessity of continuous improvement. Consequently, the KE–IPA integration serves not merely as an evaluative tool but as a strategic framework for designing targeted, efficient, and customer-oriented service quality enhancement policies, ultimately reinforcing satisfaction and loyalty in a sustainable manner.

Compliance with ethical standards

Disclosure of conflict of interest

All authors declare that there are no conflicts of interest regarding the publication of this document.

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