ABSTRACT

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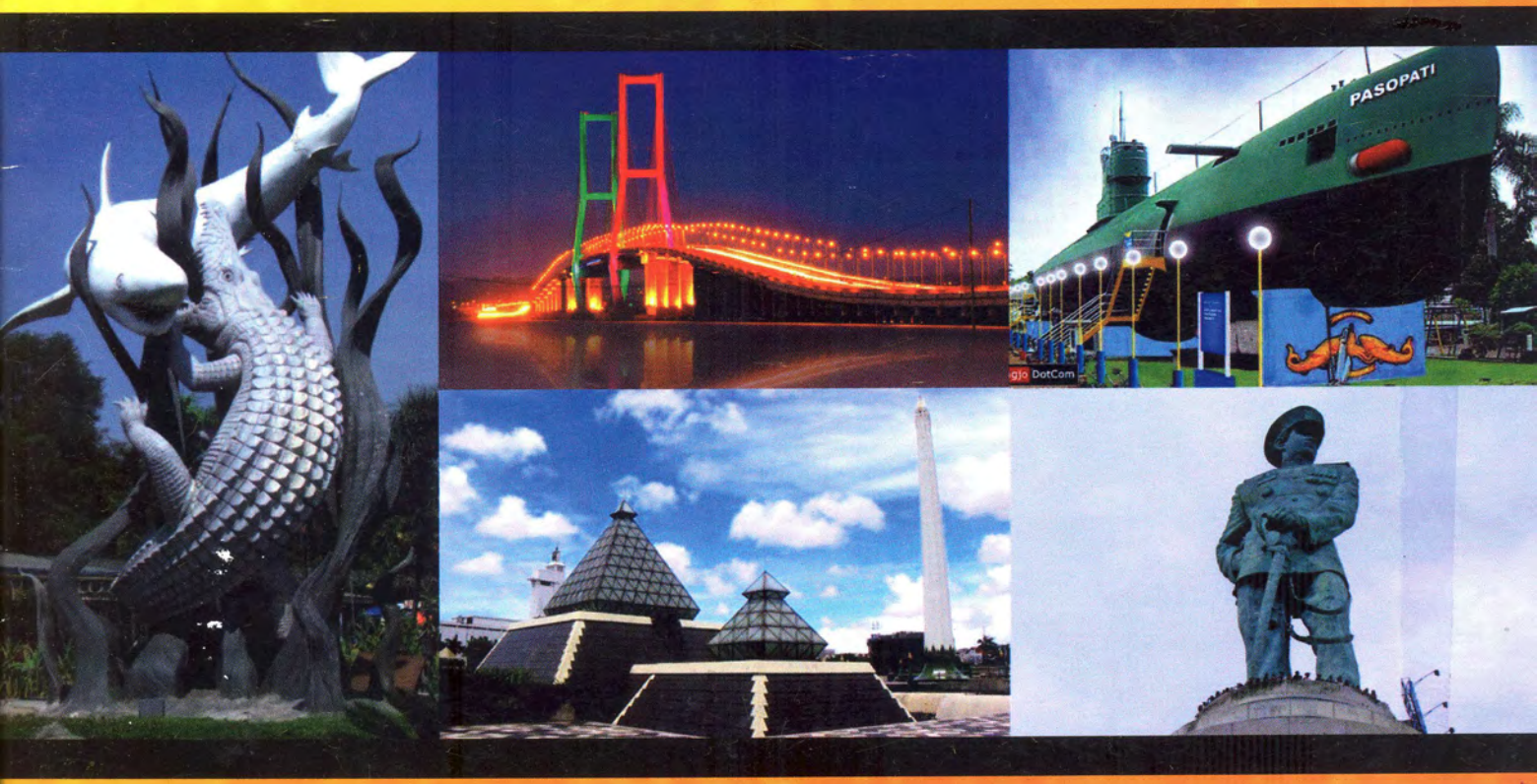

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Integrating Kansei Engineering into Kano and SERVQUAL Model to Determine the Priorities of Service Improvement (Case Study: Café Agape at Ruteng, East Nusa Tenggara – Indonesia)

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ABSTRACT

In order to improve service quality, a research framework of integrating Kansei Engineering into Kano and SERVQUAL was deployed in Café Agape. SERVQUAL model is used to identify whether the provided service has been fulfill customer needs; whether customers were satisfied and what service attributes that have negative customer satisfaction indexes. Kano model can classify the service attributes into groups, i.e., attractive, one dimensional, must be or even indifferent; the classification can be used to determine the priorities. Kansei Engineering takes the customer emotion into account and tries to identify customer needs (feelings) more specific. The integration is aimed to determine the improvement priorities. A survey of 100 customers using 21 service attributes and 10 Kansei words resulted on 15 attributes that have negative customer satisfaction score. However, only 9 attributes will be prioritized for improvement because they are Attractive (A) and One dimensional (O) attributes due to the result of Kano classification. The analysis of Kansei Engineering showed that "convenience" was the customers' most important emotion when they receive services at Café Agape. Meanwhile, there are 6 of 10 Kansei word (customer emotional needs) significantly different between two groups of Café Agape's customers; foreign/overseas customers felt happier, more relieved, friendly, welcome and attractive but less sedate/quiet than local/domestic ones when they consume services at Café Agape.

***Keywords*:** *Kansei Engineering, Kano model, SERVQUAL, improvement priorities, services*

1. Introduction

Due to the government's Visit Indonesia program, the tourism at East Nusa Tenggara has been blooming and resulting intense competition in culinary business. Many restaurants and cafés in a relatively small village like Ruteng – East Nusa Tenggara will be potentially effected on their limited market share. It forces Café Agape realizing that to get survived or even be the winner in the culinary business competition; one should focus on not only the main products offered but also the quality of customer service [1]. A good service quality is when services offered exceed the customer expectation. If the customers satisfied, it means that the service industry might have succeeded to surpass the customer needs and expectation. Thus, a measurement will be done accordingly. The SERVQUAL model by Parasuraman, et al. [2] is used to develop the customer satisfaction measurement. Normally, the improvement will be proposed on the service attributes that produce negative satisfaction indexes.

It is kindly noticed that, however, not all those service attributes that being improved have significantly impacts on customer satisfaction. Essentially, Kano model has a potential to cope with this issue. Kano model has a unique superiority to classify service attributes into several categories, i.e., attractive [A], one dimensional [O] or must-be [M] attributes and the integration between Kano and SERVQUAL model will help to determine the priority of the service improvement (see Kano et al., 1984 [3]; Hartono and Tan, 2011 [4]).The application of an integrative framework of Kano model and SERVQUAL has been extensively published. One of interesting research on the integration model of Kano and SERVQUAL (see Tan and Pawitra, 2001 [5]) had been proposed to analyze and improve the service quality at Juanda International Airport, Surabaya [6]; its research finding was the number of the service attributes that were prioritized to be improved had been reduced. It has been highlighted that the reduction process is quite important due to the limited resources and more appropriate focus in improvement initiatives.

Another interesting issue is that, according to Hartono and Tan [4], emotions currently play a big role in service development. In achieving more service excellences, Café Agape also needs to concern about the customer emotional

needs (or Kansei in Japanese). To deal with this emotional needs fulfillment, Kansei Engineering is addressed (see Nagamachi, 1995 [7]). It is a method to capture the customer emotional needs and translates customers' feeling into product or service parameters (see Nagamachi, 1995 [7]; Hartono and Tan, 2011 [4]).

Hence, the objective of this research is to propose the schematic research framework of how the integration of Kansei Engineering into Kano and SERVQUAL model in order to determine the priority for service improvements. After the priority of the attributes is already formulated, the subsequent analysis can be followed by other relevant methods such as Quality Function Development (QFD) or TRIZ to formulate and execute the improvement initiatives.

2. Research Methodology

Figure 1 shows the framework that being used in the research. The proposed research framework, however, was extended from Tan & Pawitra, 2001 [5] and Hartono & Tan, 2011 [4]. The data collections were divided into several steps as described below:

a. ***The formulation of service attributes.*** Referred to service attributes of SERVQUAL model as well as the result of interviewing eight customers and two staffs of Café Ruteng, the measurement was done by using 21 attributes which are distributed among 5 dimensions (tangible, reliability, responsiveness, assurance and empathy).

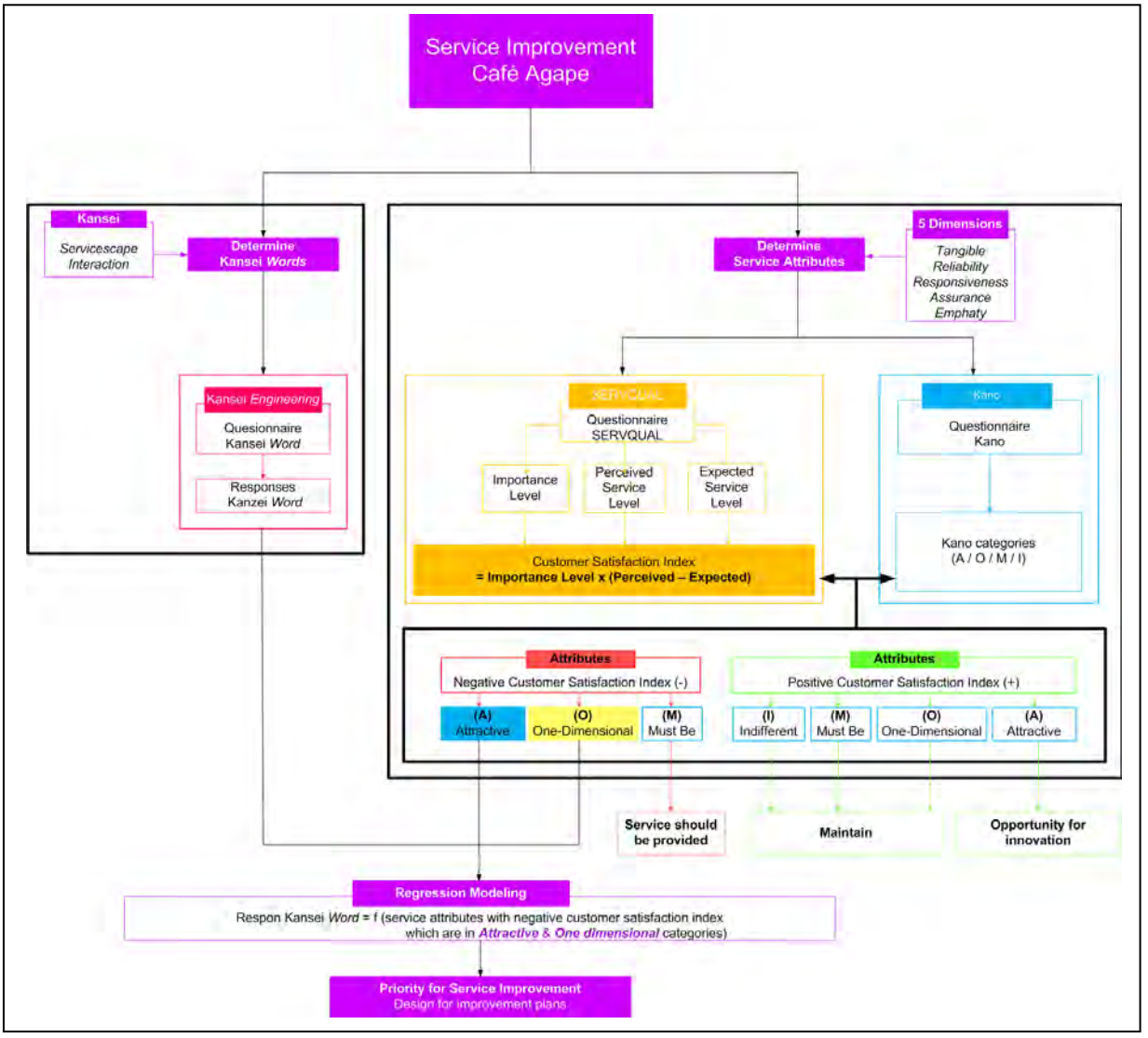


Figure 1. The framework of integrating Kansei Engineering into Kano and SERVQUAL model

b. ***The formulation of Kansei words.*** By interviewing eight customers and two staffs of Café Ruteng and combining to those Kansei words from Hartono & Tan (2011), there are 10 Kansei words being used to define the customer emotional needs.

c. ***Survey & Sampling.*** Survey was done through the distribution the questionnaire to 100 customers (60 domestic/local customers and 40 foreigners). The questionnaire consists of four parts: (i) the first part is about customers' profile, (ii) the second part is measuring Kansei word by using likert scale (from "1 = negative impression" to "5 = positive impression"), (iii) in relation to SERVQUAL, the third part is measuring the level importance, customer perception and expectation towards the service attributes by using likert scale from "1 = strongly disagree" to "5 = strongly agree", and (iv) the last part is to determine Kano categories; likert scale was also being used i.e., "1 = I like it that way" to "5 = I dislike it".

d. ***Validity &Reliability.*** All the survey results had been tested; all of the service attributes were valid and reliable (with Cronbach's Alpha > 70%).

3. Analysis and Discussion

Café Agape was launched in 2005 with its initial name "Coffee House". It began with the demand of foreign/overseas tourists i.e., mostly they desired for a cozy and comfort café for having a hot coffee in a chilled-air town. Later, Café Agape was expanded from a restaurant with the capacity of 20 to 88 guests, providing western and oriental food & beverage services. Although the target market is foreign customer, however local/domestic guests are also part of its market share.

Initial statistical hypothesis testing was done due to the conjectures that there might be any differences characteristics – importance level, perception and expectation level, emotion and opinion – between these two groups of customers (i.e., foreign versus domestic). Multivariate analysis with the significant level of Wilks' Lambda [8] was used to test against the hypotheses and the results are shown in Table 1. There is no difference importance, perception and expectation level between foreign and domestic customers so that the analysis related to customer satisfaction will not distinguish the groups. Meanwhile, it was found that there was a significant difference on Kansei responses among the groups. Further analysis can be done to indicate particular emotions that make them differ.

Table 1. Hypothesis testing between foreign and domestic customers

Multivariate Tests(b)

Characteristics	*value*	F	Hypothesis df	Error df	*p-value* Wilks' Lambda
Importance Level	.723	1.477(a)	20.000	77.000	.115
Perception Level	.714	1.583(a)	20.000	79.000	.078
Expectation Level	.748	1.332(a)	20.000	79.000	.184
Kansei responses	.435	11.544(a)	10.000	89.000	.000*)

Hypothesis:
H_0: There are **no differences (Kansei response, importance, perception, and expectation level)** between foreign and domestic customers.
H_1: There are **some differences (Kansei response, importance, perception, and expectation level)** between foreign and domestic customers.
Reject H_0 if ***p-value*≤ α (α= 0.05).** *) significant at **α = 0.05**

3.1. Integration of Kano and SERVQUAL Model

By taking into account customer satisfaction score, as shown as Table 2, there were 6 out of 21 service attributes that had positive satisfaction score, i.e., "menu is various", "payments and refunds are fast and accurate", "customers feel safe when eating at Café", "music and sound are available and adequate", "wireless internet access is provided and fast", and "opening and closing hour is on time"; those attributes could be regarded as "strengths" that should be maintained for its performance. From 15 attributes with negative satisfaction score, only 9 attributes had been analyzed furthermore since those attributes were classified as attractive (A) and one dimensional (O) according to Kano category. Attractive and one dimensional attributes had been chosen regarding to their importances and impacts on increasing customer satisfaction as well as customer loyalty (see Tan and Pawitra, 2001 [5]). There are several methods [9] of how to classify the attributes in Kano model, however, the method "Better Worse" was chosen. The comparison methodolo-

gy in [10] was used by Sari et al [11] and concluded that "Better Worse" is a Kano classification method that is more valid compared to any other classification methods in Kano model.

Table 2. Output of SERVQUAL analysis (satisfaction score) and Kano classification

No SA	Service Attribute (SA)	Mean of			Satisfaction Score *)	Kano *) Classification
		Importance	Expectation	Perception		
	Reliability					
1	The menu is various	4,340	3,850	4,090	1,042	A
2	The food is clean and fresh	4,930	4,630	4,560	-0.345	M
3	The prices on the menu is suitable to the note payments	4,790	4,640	4,630	-0.048	M
4	The food preparation is fast and precise **	4,690	4,220	3,700	-2,439	A
5	The payments and refunds of bill are fast and accurate	4,520	4,200	4,280	0.362	M
	Responsiveness					
6	The staffs (waiter/waitress) have good understanding that are able to explain the provided menu **	4,680	4,420	2,990	-6,692	O
7	Employees provide quick response and show the willingness when consumers ask for help **	4,510	4,350	3,400	-4,285	O
8	Waitress/Waitresses give the information about seasonal menu (e.g. Today's Menu)	4,000	4,100	3,530	-2,280	I
	Assurance					
9	Employees have ability to communicate well, friendly, and politely **	4,710	4,600	4,300	-1,413	O
10	Customers feel confidence and safety when eating at Agape Cafe	4,360	4,270	4,370	0.436	I
11	Music and sound are available and adequate	3,900	4,060	4,370	1,209	A
12	Free wireless internet access is provided and fast	3,870	4,020	4,310	1,122	A
	Emphaty					
13	The staffs show kindly greeting (e.g. say welcome, thank you and an apology) **	4,620	4,510	3,730	-3,604	O
14	The Agape Café's opening and closing hour is on time	4,000	4,190	4,190	0.000	I
15	Delivery service is easy and fast	4,295	4,318	3,477	-3,612	I
16	Employees are patient and caring **	4,469	4,430	4,030	-1,788	O
	Tangible					
17	Employees are well looking and attractive appeal **	4,490	4,210	3,310	-4,041	A
18	The menu book/list is interesting and informative **	4,230	4,260	3,420	-3,553	A
19	The table manners (e.g. tableware, tables, chairs) are ready, clean, neat and comfortable	4,670	4,500	4,330	-0.794	M
20	The hand wash basin and toilet are clean, neat, and comfort	4,640	4,340	4,290	-0.232	M
21	Interior design is attractive and comfortable **	4,430	4,440	4,210	-1,019	A

*) Satisfaction Score = Importance x (Perception – Expectation)
Kano classification: A (Attractive), O (One Dimensional), M (Must-be), I (Indifferent)
** Attributes that were chosen as improvement priorities

Those 9 attributes that had been set as priorities for improvement are as follow:

- Four attractive attributes (A), i.e., "food preparation is fast and precise", "employees are well looking and attractive appeal", and "menu book/list is interesting and informative" and "interior design is attractive and comfortable"
- Five one dimensional attributes (O), i.e., "staffs have good understanding that are able to explain the provided menu", "employees provide quick response and show the willingness when consumers ask for help", "staffs show kindly greeting", "employees are patient and caring", and "table manners (e.g., tableware, tables, chairs) are ready, clean, neat and comfortable".

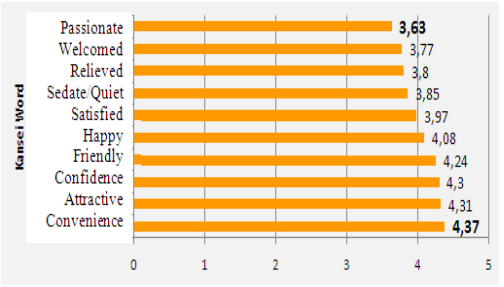
3.2. Kansei Engineering

In order to identify what emotions those are essential for Café Agape's customers, a measurement using 10 Kansei words was performed. Kansei words refer to the emotions in which customers feel when they receive services. For each of Kansei words, it had been defined accordingly to prevent diverse customer perception. The result of measurement, as shown as Figure 2 (a), explained that "convenience" was the customers' most important emotion (the highest mean 4.37 of 5). It was not surprisingly in view of the fact that Café Agape is one of the famous restaurants which serves a unique, ethnic and nature interior design with proper room temperature and comfortable furniture. Furthermore, Café Agape which has a-15-hour operation time and is equipped by other facilities (e.g., music, fast and free wireless internet connection) made the consumers tend to spend longer for chatting as well as browsing.

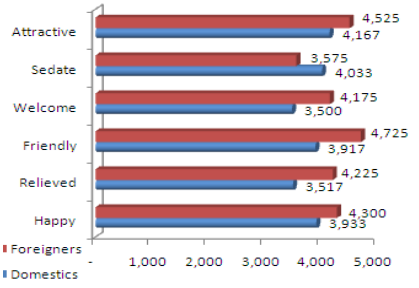
As discussed before, the statistical testing showed that there was significant difference on customer emotions between domestic and foreign samples. Further analysis, i.e., Multivariate-Post Hoc Multiple Comparison for Observed Mean [8]

was done and the result as shown in Figure 2 (b) described that there were 6 Kansei words (out of 10) differ between foreign and domestic customers.

During service encounter stage, foreign customers appeared to be happier because Café Agape provides western food & beverage that is quiet familiar to them. Moreover, Café Agape is nearby tourist accommodation, thus, customers feel easy to find it. Café Agape is also perceived as a reliable restaurant that provides delicious meals. Foreign consumers feel more relieved and attractive due to unique interior design which is furnished by traditional music equipment with the concept of "*nature ambience, comfortable, and feel relaxation*". Customers also experienced directly with the production of Flores coffee that they consume at Café Agape. From their point of view, it is presumed that internet access was difficult to find in a small town like Ruteng, in contrary, Café Agape provides them free and fast wireless internet connection. The attitude of staffs to greet and the ability of them to communicate friendly and politely made foreign customers feel more welcome and friendly. However, there was only one Kansei Word i.e., "sedate/quiet" whose mean of domestic customers was higher than the foreign ones. In other words, foreign customers felt less sedate. There were people selling songket fabric (i.e., a kind of typical traditional fabric of Ruteng) surroundings Café Agape. These people frequently offer the products to foreigners, as their main market target, even when they enter, consume or leave the restaurant. Moreover, in the period of the staffs that chatted among themselves and the suppliers of the restaurant walked passing through the customers could cause foreign customers feel so.



(a) mean of Kansei Words



(b) mean comparison between domestic and foreign customers

Figure 2. Output of Kansei Engineering

3.3. Integration Kansei Engineering into Kano and SERVQUAL Model

In order to satisfy the customers, it is essential to fulfill the customer emotions and satisfy their expectation. This is why Kansei Engineering has been integrated into Kano and SERVQUAL model. The integration, somehow, is done throughout a multiple linier regression function i.e., $y_n = a + b_1x_1 + b_2x_2 + \cdots + b_nx_n$; where y_n refers to responses of Kansei word and x_n refers to perceived level of each significant attributes (i.e.,, 9 attributes that were chosen as improvement priorities, see Table 2); and a and b_n are constants of a multiple linier regression. The integration aimed to indicate which service attributes impact significantly to customer emotions (Kansei Word). According to the result of regression, as described in Table 3, some interpretations were taken into account such as "*model is not available/significant*" means that customers have no specific emotions when experienced the service attributes whereas positive b_n in a significant model means an improvement in the service attribute x_n will increase the value of customer emotion y_n and vice versa. However, the difference output of linier regression between domestic and foreign customers indicates interesting issue that service delivery and improvement should be differ according to different segment of consumers [12].

Table 3. Output of integration: multiple linier regression model for Kansei word vs service attributes

Kansei Word	p-value	R^2	Linier regression model (significant level at α = 5%)	significant service attributes
Domestic customers				
Happy	0.013	0.103	Happy = 2.195 + 0.470 A_4	The food preparation is fast and precise (A_4)
Sedate/quiet	0.018	0.131	Sedate = 4.084 - 0.545 A_{13} + 0.509 A_4	The staffs show kindly greeting (A_{13})
				The food preparation is fast and precise (A_4)
Attractive	0.002	0.196	Attractive = 1.591 + 0.361 A_7 + 0.324 A_{21}	Employees are quick and showing the willingness to help (A_7)
				Interior design is attractive and comfortable (A_{21})
Relieved, Friendly, Welcome	*Model is not available*			
Foreign customers				
Happy	0.006	0.184	Happy = 5.853 - 0.372 A_9	Employees have ability to communicate (A_9)
Relieved	0.003	0.215	Relieved = 2.437 + 0.411 A_{21}	Interior design is attractive and comfortable (A_{21})
Welcome	0.009	0.165	Welcome = 2.618 + 0.384 A_{16}	Employees are patient and caring (A_{16})
Sedate/quiet	0.001	0.259	Sedate = 1.146 + 0.607 A_{13}	The staffs show kindly greeting (A_{13})
Attractive, Friendly	*Model is not available*			

4. Conclusion & Further Research

The research framework of integrating 3 methods (i.e.,, Kansei Engineering, SERVQUAL and Kano model) can be potentially used as a schematic guidance in order to determine the improvement priorities. Strategies for service improvement can be formulated to those attributes that have negative satisfaction score as well as to accelerate the innovative initiatives through the identification of attractive and one dimensional attributes. Meanwhile, specific customer emotions can increase the importance level of service attributes that should be improved.

From a survey of 100 customers, domestic and foreign customers, by using 21 service attributes and 10 Kansei words, the research has figured out 9 attributes for improvement priorities, as shown in Table 4. Further research such as the deployment of Quality Function Development or TRIZ can take those attributes into account as the "What" to develop the "How" in order to formulate the strategies for service improvement. This initiative has been done by Hartono et al., 2012 [12], however, this approach might be potentially explored and extended. Otherwise, the research framework can be applied in any other service sectors.

Table 4. Summary of improvement priorities

Service Attributes	Satisfaction Score	Kano Classification	Significant Kansei Word	
			Domestic	Foreigner
Employees are well looking and attractive appeal	-4.041	A	-	-
The menu book/list is interesting and informative	-3.553	A	-	-
The food preparation is fast and precise	-2.439	A	Happy, Quiet	-
Interior design is attractive and comfortable	-1.019	A	Attractive	Relieved
The staffs (waiter/waitress) have good understanding that are able to explain the provided menu	-6.692	O	-	-
Employees provide quick response and show the willingness when consumers ask for help	-4.285	O	Attractive	-
The staffs show kindly greeting (e.g. say welcome, thank you and an apology)	-3.604	O	Sedate/quiet	Sedate/quiet
Employees are patient and caring	-1.788	O	-	Welcome
Free wireless internet access is provided and fast	-1.413	O	-	Happy

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