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Incorporating service quality tools into Kansei Engineering in services: A case study of Indonesian tourists

Markus Hartono^{a,*}

^aDepartment of Industrial Engineering, University of Surabaya Jalan Raya Kalirungkut, Tenggilis, Surabaya 60293, Indonesia

Abstract

Due to market dynamics and challenges, it is imperative for companies to put their concern on strategic marketing orientation. In fact, products and services of similar quality are ubiquitous in today's global market. Basically, functionality and usability alone are no longer prominent success factors in product and service innovation because customers today concern themselves more on satisfying their emotions than merely their cognition. Kansei Engineering (KE) has shown its superiority in investigating and modelling customer emotion (“Kansei” in Japanese) for product development. In dealing with customer needs, service quality tools such as quality function deployment (QFD) and the Kano model, have been applied extensively. But none have been able to incorporate and model customers' emotional needs. Some attention has been given to investigate this but, thus far, there is no formal methodology that can account for customer emotional needs in service design. To fill this niche, this study proposed an integrative framework of KE incorporating the Kano model and QFD applied to services. This study extended the work by Hartono and Tan (2011) and Hartono et al. (2012) and presented a survey on luxury hotel services involving more than a hundred Indonesian tourists as the subject of study. Luxury hotels are reported to have greater strength of emotion than any other hotel segment. This work confirmed that emotion is to be more important than cognition in impacting overall customer satisfaction. Practically, it gives insight on which service attributes deserve more attention with regard to their impact on customer emotion. Indonesian tourists shared a common response to the Kansei word “elegant” which correlates with their common cultural dimension of “power distance”. Performing a Kansei evaluation to understanding cultural backgrounds may yield valuable insights for international tourist marketing strategies and companies' business sustainability.

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Keywords: Kansei Engineering; service quality tools; strategic market orientation; innovation; sustainability

* Corresponding author. Tel.: +62-31-2981392; fax: +62-31-2981376 .
E-mail address: markus@ubaya.ac.id

1. Introduction

Market dynamics and technological uncertainty play important role in influencing company's internal processes (e.g., components, tools/methods and systems) to produce organizational outputs. These factors can potentially affect company's capabilities because they bring new scientific knowledge that influences the intensity of competition, economy of scale and scope, and also customer preferences and demands (Smith et al., 2005). To deal with this issue, a company should react promptly through appropriate strategies. One thing to address is a long-term strategic marketing orientation.

Internal and external factors may contribute to the organizational performance. According to Asikhia (2010), long-term orientation strategy emphasizes long-term results and devotes time and efforts to long-term decision processes and activities. By taking a case study on banking services, Asikhia (2010) highlights that functional units of the bank should align their vision, decision processes and activities in order to obtain more effective, efficient and better performance. In general, service managers should take into account organizational culture and managerial systems that affect the practical demonstration of strategic marketing orientation variables.

Since market dynamics is related closely to customer preference, putting the interests of customers first will be the most prioritized marketing strategy. A customer-focus is considered to be the most fundamental aspect of market orientation by many researchers (Heiens, 2000). In line with marketing concept of "forward-looking business orientation", a customer-focused business is quite likely and reasonable to be more interested in long-term business success as opposed to short-term orientation (e.g., short-term profits) (Heiens, 2000).

In terms of product and service offerings, a customer-focus is a way to deal with successful business transaction. Designing for customer experience is increasingly important for the success of new services and products. Basically, there are two challenges. First, customer experience is determined by both service and interaction with the product during service provision. Second, customer experience is formed in all moments of interaction with a product or a service. Recent studies show that products and services hold great appeal if they are attractively designed to elicit emotional feelings from customers (Hartono and Tan, 2011). Customers today tend to be disloyal to any products or services. Organizations and companies must listen closely and carefully to the voices of their customers, especially their latent needs. These are the unspoken emotional needs that customers seek in products and services.

According to Nagamachi and Lokman (2011), good quality products are not enough to win market competition. However, products that consider peoples' feelings and emotions will sell. Thus, businesses must strive for total customer satisfaction and delight (Bowen and Schneider, 1999). Nowadays, the focus by customers has shifted from objects to product and service experiences. This refers to the switch from functionalism to product semantics (Krippendorff, 1995). This is deemed to be the new battleground (Shaw and Ivens, 2002). The impression of product experience brings customer satisfaction (Khalid and Helander, 2006; Schifferstein and Hekkert, 2008). Norman (2004) argues that customers are delighted as the products and services that they use are easy to deal with and more harmonious results are produced.

In dealing with customer emotions in product design and development, Kansei Engineering (KE) has been proposed since the 1970s (see Fig. 1). KE is conceived as the only tool that can quantify customer emotions and translate them into product features (Nagamachi, 1995). Its extension into services was initiated by Nagamachi in the 1980s (Nagamachi and Lokman, 2011). In addition, work by Hartono and Tan (2011) and Hartono et al. (2012) have enriched the application of KE into luxury hotel services. Up to today, however, KE application in services is still relatively unexplored.

This paper is organized as follows. Following the introduction, research objectives and a brief review of strategic market orientation for sustainability, Kansei Engineering, service quality tools (i.e., SERVQUAL model, the Kano model and quality function deployment [QFD]) are presented. Thereafter, research methodology and a result of empirical study on luxury hotel services are discussed. Lastly, this paper provides conclusion and further research recommendation.

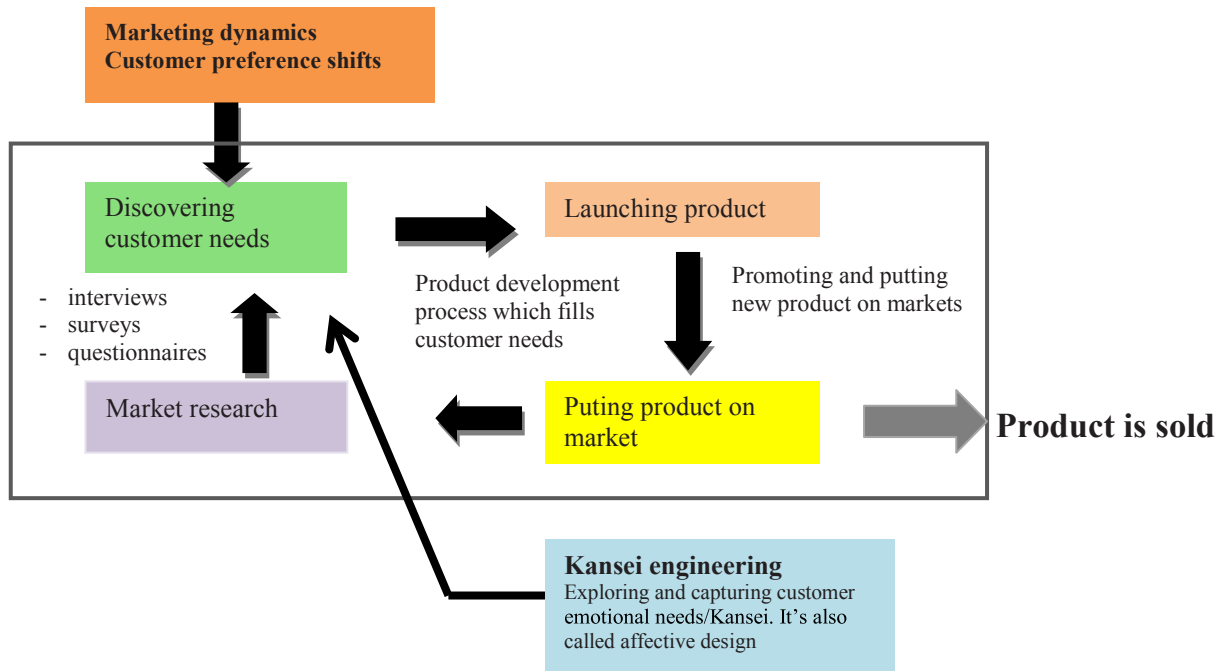


Fig. 1. The importance of KE in product/service development process incorporating market & preference dynamics

2. Research objective

Service quality tools have been extensively utilized in service research. A very well known method, quality function deployment (QFD), is a planning process for translating customer needs into appropriate organizational requirements at every stage of a product's life cycle, from research to sales to service. The most important matrix is known as the house of quality (HOQ) which is made up of two main parts: "whats" and "hows". This tool helps an organization set targets and determine the priority of actions need to be taken. However, this tool does not provide procedures how to capture customer needs, especially for emotional needs. There is no distinction of the nature of customer needs within the "whats" (e.g., emotional *versus* non-emotional needs).

To improve the quality of service organization, SERVQUAL model (Parasuraman et al., 1988) is proposed. This model assumes that the relationship between customer satisfaction and service attribute performance is linear. The implication is that low customer satisfaction result from low attribute performance. Thus, this will be the focus for improvement. It is, however, not necessarily true. Customer satisfaction can sometimes be highly improved by a small improvement of a service attribute that is unexpected. Here, the Kano model plays an important role in categorizing the product and service performances. This study focuses on attractive quality performance which is also known as "delighter". It is something not requested by customers. However, once it is fulfilled, it makes the customers delighted and highly satisfied. By incorporating the Kano categorization into SERVQUAL, this limitation can be overcome (Pawitra and Tan, 2003).

Thus, this study has two main objectives. First, it is to propose an integration of service quality tools/methods into KE methodology. Second, it is to test the applicability of the proposed methodology into services incorporating one group of sample (i.e., Indonesian tourist). It is expected that the integration of SERVQUAL, Kano's model, QFD and KE methodology can result in ways to close the gap between perceived service and predicted service for current and future customer emotional needs.

3. Literature review

3.1. *Strategic marketing orientation and Macroergonomics*

According to Miles and Snow (1978), companies or organizations may develop enduring patterns of strategic behavior that actively co-align the organization with its dynamic environment. They developed three strategic solutions to deal with these issues, i.e., (i) an entrepreneurial problem set (an organization's product-market domain); (ii) an engineering problem set (technologies and processes); and (iii) an administrative problem set (organizational structure and policy processes). How to address the unique and latent needs of customers and business partners seems to be a critical solution. As an implication, it may create technological change and uncertainty in terms of technical innovation in components, systems or methods for dealing with market demands (Asikhia, 2010).

According to Heiens (2000), there are four different approaches to market orientation (i.e., "customer preoccupied", "marketing warriors", "strategically integrated" and "strategically inept"). "Customer preoccupied" is also known as customer-focus that urges strongly the importance of long-term business success rather than short-term profits. This concept puts the first priority on customers first, thus, it's in line with forward looking orientation for business strategy. The "marketing warriors" concept focuses on relevant competitors in order to investigate organization's strengths and weaknesses (SWOT analysis). The third concept, "strategically integrated" promotes a balance between customer-focused and competitor-focused. In contrast to that, it's called "strategically inept", it is when an organization or a company fails to orient its strategic decision to market environment. An organization which focuses on both competitor and customer is said to be effective in its marketing strategy (Kotler, 1977). According to Kohli and Jaworski (1990), by focusing on market orientation an organization shows its ability to generate and utilize distinctive information about customers and competitors.

Related to working systems and human factors/ergonomics area, it relates to macroergonomics concept. It concerns with the analysis, design and evaluation of sociotechnical systems. According to Hendrick (2002), sociotechnical systems present the interaction of : (i) job design; (ii) hardware and/or software; (iii) internal environment; (iv) external environment; and (v) organizational design. In regard to market dynamics and environmental change, macroergonomics proposes that an organization should be responsive to external environment (e.g., customers, material resources, etc.).

3.2. *Kansei Engineering (KE) as an innovative methodology for product and service design and development*

In Japanese, a term for human emotion is known as Kansei. It is a concept of sensing a phenomenon or an artifact that builds impressions. According to Nagamachi (1995), Kansei is defined as customer psychological feeling and image of a new product. Understanding Kansei will lead to creative ideas and innovations. People with rich Kansei are those who are full of emotion, knowledge and passion, and those who are sensitive and responsive to any change.

Kansei Engineering (KE) is defined as an ergonomic technology of customer-oriented product development. This method focuses on user feelings and needs (Nagamachi,1995). It is the first and foremost product development methodology that translates customer impressions, feelings and demands on existing products and concepts into concrete design parameters (Nagamachi, 1995; Schütte, 2004). The application of KE covers products and services. They include interiors and car designs (i.e., Mazda, Nissan, Mitsubishi, Toyota, Honda, Ford, Fiat and Hyundai), brassieres (i.e., Wacoal), housing (see Llinares and Page, 2011), drink (i.e., Asahi beer), electronics (i.e., Sharp's VTR LCD ViewCam) and services (i.e., restaurant, ladies' wear department, supermarket's cashier).

Inherently, according to Hartono et al. (2012), KE is considered superior to other similar methods. It has several distinctive characteristics as follows. First, KE is able to minimize subjectivity by building a mathematical model between Kansei responses through all the human senses and external stimuli. Second, besides dealing with attractive exterior and physical appearances, KE has an ability to optimize properties which are not directly detectable or visible (i.e., interior/hidden qualities). Third, KE is known as a quality framework with an integrated set of tools and methods. It deals with dynamic market and customer preferences. Hence, KE applies statistical engineering in the use of service tools (Nagamachi and Lokman, 2011). Forth, KE has a strong ability to grasp and accommodate 21st century trends, which are hedonistic, pleasure and individualistic. This is where customers tend to focus on their emotional impressions rather than merely on product functionality and usability (Nagamachi, 1995; 2002).

3.3. Service quality tools relevant to Kansei Engineering (KE)

SERVQUAL model, the Kano model and quality function deployment (QFD) are considered relevant service tools to be used in KE methodology. The quality of products and services is measured by the degree to which the products and services meet the customers' expectations and needs. Parasuraman et al. (1988; 2005) introduce a service quality model (known as SERVQUAL) for measuring and exploring overall customer experiences. This model covers five dimensions that can represent human system interaction during service encounter, i.e., tangible (all physical facilities and personnel appearances); reliability (it is an organization's ability to perform the promised services accurately); responsiveness (it refers to the willingness to help customers and provide prompt services); assurance (it is the knowledge and courtesy of employees and their ability to convey trust); and empathy (it is a caring and individualized attention that an organization provides).

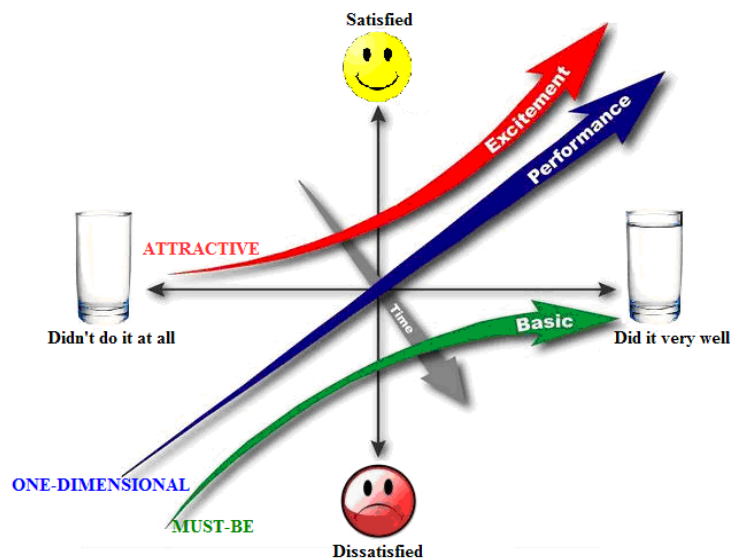


Fig. 2. The Kano's categories as modified from ReVelle et al. (1998)

In addressing product and service performance category, the Kano model is proposed. Generally, this model categorizes customer attributes into three different types, namely, Must-be (M), One-dimensional (O) and Attractive (A) (see Fig. 2). According to Kano et al. (1984), a must-be (M) is something taken for granted and not mentioned explicitly by customers. The absence of this attribute will cause significant dissatisfaction, while

the existence of it will not give any significant impression. A one-dimensional (O) attribute shows the linear relationship between customer satisfaction and the performance of the product/service attribute. Better performance evokes higher level of customer satisfaction. The most interesting category is called attractive (A) attribute. A little fulfillment of this attribute creates a great deal of satisfaction. According to Hartono et al. (2012), the idea of integrating the Kano model and KE was first investigated by Lanzotti and Tarantino (2008). There has been a very little research, however, that analyzed the relationship between the performance of products/ services and Kansei.

QFD is a quality tool to improve customer satisfaction by translating their requirements into appropriate technical measures (Sullivan, 1986; Akao and Mazur, 2003). Not only does this increase customer satisfaction, QFD also delight customers through innovation. The critical part in QFD is to construct a house of quality (HOQ). It is where customer requirements meet with technical measures. An HOQ serves as a product-planning matrix that consists of customer requirements, technical measures, target values and competitive analyses.

4. Framework development, research methodology and empirical study

This study applied case study and survey as research strategy. Case study is commonly used when a ‘how’ or ‘why’ question is being asked about a contemporary set of events over which the investigator has little control. This type of research strategy is found to be the most powerful research method in the exploration phase and theory building, testing and extension, and quantitative analysis (Voss et al., 2002; Fowler, 2009). Personal interviewing and face-to-face questionnaire were utilized to collect data.

This study proposed an application framework which consists of five main steps applied as shown in Fig. 3 (Hartono and Tan, 2011; Hartono et al., 2012). They include initial phase, span the semantic space, span the service attributes space, model and analysis, and adjustment for action. In this study, luxury hotel services (4- and 5-star hotel services) was chosen. This hotel type is considered to be emotion-boosting. According to Barsky and Nash (2002), luxury hotel is reported to have greater strength of emotions than any other hotel segment. The interviewer explained the study objectives and unfamiliar terminologies and answered any doubts from the participants. In total, 181 Indonesian tourists who stayed at least 2 nights in luxury hotels participated in this study (see Appendix A for the details).

This study utilized a modified SERVQUAL model with 39-service attributes which are deployed into five dimensions (i.e., tangible, responsiveness, reliability, empathy, and assurance; see Appendix B for the details). For example, *“the receptionist and information desk is visually appealing”*, *“the bill is charged accurately”* ... *“the employees have knowledge in answering your enquiries”*. A five-point Likert scale that ranged from “1 = strongly disagree” to “5 = strongly agree” was used to rate the customer perception on each hotel attribute (perceived service quality). Through validity and reliability tests using SmartPLS 2.0, all service attributes were deemed to be valid and reliable (see Table 1). Afterwards, the Kano categorization was inserted. This is in order to give a better understanding of service attribute performance. The Kano questionnaire was used to classify each of service attributes into attractive, one-dimensional, must-be, indifferent, questionable or reverse (see Hartono and Tan, 2011).

It was then continued to span the semantic space, i.e., to collect and select Kansei words. Due to complexity, this study used the evaluation of words (spoken) and their emotional impact on the human mind. The evaluation of Kansei words is also called affective process, which is deemed as the main focus of this study. The evaluation of these Kansei words referred to the ratings of emotions rated by the tourists after experiencing certain services. The five-point Semantic Differential (SD) scale which ranged from “1 = absolutely negative Kansei” to “5 = absolutely positive Kansei” was applied. Based on reliability and validity tests (using SmartPLS 2.0, see Table 1), there were 15 Kansei words include “convenience”, “attractiveness”, “cleanliness”, “welcomeness”, *et cetera*. By using Kruskal-Wallis test, Kansei “elegance” was rated to be the highest score.

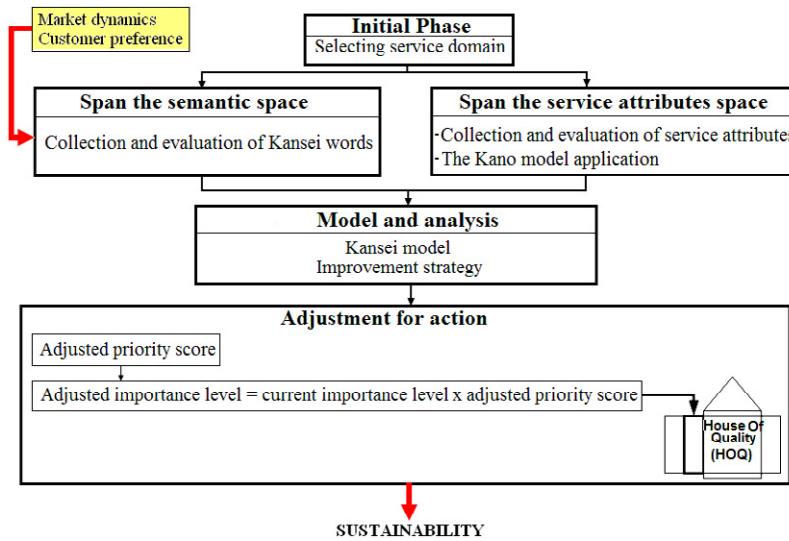


Fig.3. The application framework of KE in services incorporating service quality tools for business sustainability

Table 1. The output of reliability and validity tests using SmartPLS 2.0

Construct	Components of measurement		
	AVE*	Composite reliability	Cronbach's alpha
Kansei	0.498	0.937	0.928
Perceived service quality	0.510	0.971	0.970

*Average Variance Extracted

The selected Kansei words and the attractive service attributes (A) were then met and linked together. This was facilitated by using multiple linear regression ([Schütte, 2004], see Appendix C the for details). Then, it proceeded to the analysis stage by engaging the significant models only. The action was to propose “continuous improvement” based on the service gap (i.e., perception and expectation scores) and the impact to significant Kansei words. A service attribute with higher number of affected Kansei words is given higher priority for improvement (see Table 2).

Table 2. Prioritized continuous improvement for service attributes

Significant service attribute with [A] category	Significant Kansei word	Gap*	Priority
A ₁₃ . The scent in hotel’s room and lobby	Convenience, welcomeness, confidence, friendliness	-0.82	2
B ₃ . Charged bills	Attractiveness	-0.68	7
B ₄ . All size of servings	Elegance, relief	-0.76	5
B ₅ . The employee’s problem solving skill	Satisfaction	-1.00	6
C ₄ . Response to customer’s request	Cleanliness, happiness, relaxedness, peacefulness, satisfaction, spaciousness, relief	-0.92	1
E ₃ . Personal attention	Attractiveness, elegance, modernization	-0.68	3
E ₆ . Operating hours	Relaxedness, quietness	-0.92	4

*The gap between perception and expectation scores

The final step was to engage HOQ for closing the gaps between customers’ expectations and perceptions (Pawitra and Tan, 2003). An HOQ was established to develop action plans to continuously improve the weak attractive service attributes. The “Whats” referred to the prioritized attractive attributes. The “Hows” adopted the standards of luxury hotel services by Chang and Chen (2011). First, the score for each weak attractive attribute (called the “adjusted priority score”) was determined. The first priority service attribute was given the highest score and then normalized. For instance, the attribute “A₁₃” was given the score of 6 (see Table 3).

Through normalization, its “adjusted priority score” became 0.21 ($= 6/[1+2+3+4+5+6+7]$). Second, we incorporated the “adjusted priority score” and “current importance level” to calculate “adjusted importance level” score. The greater the “adjusted importance level”, the more important is the item. The adjusted prioritized continuous improvement actions incorporating HOQ is presented in Appendix D.

Table 3. Adjusted importance level of significant service attribute

Significant service attribute	Priority	Score	Adjusted priority score	Importance score	Adjusted importance level
A ₁₃ . The scent in hotel’s room and lobby	2	6	0.21	3.89	0.83
B ₃ . Charged bills	7	1	0.04	4.08	0.15
B ₄ . All size of servings	5	3	0.11	3.89	0.42
B ₅ . The employee’s problem solving skill	6	2	0.07	4.23	0.30
C ₄ . Response to customer’s request	1	7	0.25	4.08	1.02*
E ₃ . Personal attention	3	5	0.18	4.23	0.76
E ₆ . Operating hours	4	4	0.14	4.11	0.59

*The most prioritized service attribute

5. Discussion

With regard to market dynamics especially customer emotional preferences for Indonesian tourists, not all service attributes were considered attractive and significant to their Kansei/emotions. Through the analysis of Kano’s model and Kansei modeling, there were seven service attributes deemed to be important to customer emotional needs. They include the scent in hotel’s room and lobby, charged bills, all size of servings, the employee’s problem solving skill, employee’s response to customer’s request, employee’s personal attention and also operating hours. In supporting what should be prioritized for continuous improvement program (Kaizen philosophy), hotel managers should be aware of these seven service attributes. The question is that, given a very limited budget, what service attribute is the most prioritized?

Using a HOQ for a combined KE methodology, a service attribute “employees’s response to customer’s request” was found to be the most important. This service attribute relates closely to several managerial strategies or strategic marketing orientation. Overall, manager for luxury hotel should take care of several important managerial stuffs. They include personnel management, general affair management, employee training, room service, customer relationship management (CRM), information service and some additional services. More specifically, in relation to “employee’s response to customer’s request”, intensive regular trainings about character building, leaderships, communication skills and focus on customers are necessary. Hotel management should assure sufficient number of staffs equipped with relevant knowledge and professionalism. To reinforce customer-delight consciousness, a campaign slogan (such as “Always there for customer”) might be adopted (Hartono and Tan, 2011).

Indonesian tourists perceived Kansei “elegance” as the most influential emotions during service encounter in luxury hotel services. By referring to Hofstede and Bond (1988), this Kansei “elegance” is quite related to cultural dimension of power distance. Indonesian has a very high score on power distance (78/100). This culture explains the unequal distribution of power and authority. The grandeur of luxury hotels is perceived to be tangible objects which reveal the extent to which the service providers respect ‘the power of the superiority (Hsieh and Tsai, 2008). It gives another practical implication that service managers of luxury hotel should take into account the impression of “elegant” when they serve Indonesian tourists.

6. Conclusion and future research

Today’s organizations may be evolving dramatically due to global change and individual preference. This market dynamics influences organizational outputs and its strategic marketing orientation. Trends in the 21st century are hedonisms, pleasures and emotions of delights. Delighting customers is an essential key for

achieving total emotional satisfaction and customer retention. It requires positive impressions and delights beyond customer expectation (known as Kansei). It is known as long term strategic marketing orientation that aims to achieve sustainable competitive advantage.

In dealing with customer emotional feelings, Kansei Engineering (KE) has been proposed. Its integration with several quality tools such as SERVQUAL model, the Kano model and QFD brings significant contribution and enhancement to deal with customer dynamics. This method is able to capture customer emotional needs and then continued to build a mathematical model that represents the relationships between Kansei and service attributes. Specifically, in a practical point of view, it gives a guideline for service managers in investigating which service attributes are significantly sensitive to customer delights and in giving a priority for continuous improvement. Its practical impacts can be large as service is the fastest growing sector in today's businesses.

This research has limitations on sample size used and relevant service quality utilized. In future research, the investigation on potential service quality tools may be considered. In addition, the use of sophisticated tools to measure customer emotions can be of high value, such as Electroencephalography (EEG) and Electromyography (EMG).

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Appendix A. Profile of respondents

Variable	Measures		Variable	Measures	
	Frequency	% of total		Frequency	% of total
Hotel category			Monthly income		
4-star hotel	72	39.8	<=US\$2000	66	36.5
5-star hotel	109	60.2	US\$2001-3000	59	32.6
Gender			US\$3001-4000	32	17.7
Male	91	50.3	>US\$4000	24	13.3
Female	90	49.7	Frequency of stay		
Age (years)			Less than once a year	36	19.9
<=20	10	5.5	Once a year	43	23.8
21-30	55	30.4	Twice a year	36	19.9
31-40	45	24.9	Three times a year	41	22.7
41-50	55	30.4	Four times a year	19	10.5
>50	16	8.8	Five times or more a year	6	3.3
Frequency of travel			Highest education		
Once a year or less	41	22.7	Junior high or equivalent	12	6.6
Every 6 month	53	29.3	High school or equivalent	76	42
Every 3 month	42	23.2	College or university degree	71	39.2
Every month	28	15.5	Post graduate	22	12.2
>=once a month	17	9.4	Occupation		
Purpose			Clerical/office	6	3.3
Vacation	85	47	Engineering	23	12.7
Business trip	49	27.1	Entrepreneur/self-employed	48	26.5
Conference	28	15.5	Management	19	10.5
Social visit	19	10.5	Education	26	14.4
Amount of time spent (days)			Finance	25	13.8
<=3	78	43.1	Marketing	27	14.9
4-7	64	35.4	Student	6	3.3
8-11	39	21.5			
>11	-	-			

Appendix B. List of service attributes in luxury hotel

No	Service Items
A	TANGIBLE ELEMENTS/PHYSICAL SURROUNDINGS
A ₁	The receptionist and information desk is visually appealing
A ₂	The employees' uniforms are clean, nice, and neat
A ₃	The hotel has modern-looking equipment
A ₄	The hotel's interior and exterior are well managed and maintained
A ₅	The outdoor environment is visually clean
A ₆	The atmosphere of restaurant is inviting appetite
A ₇	The shops are attractive
A ₈	The hotel's lobby is comfortable
A ₉	The bedroom and bathroom are clean and convenient
A ₁₀	The hotel is well lighted
A ₁₁	The sports facilities are well maintained, clean, and convenient
A ₁₂	The music in hotel's lobby is soft and nice
A ₁₃	The scent in hotel's room and lobby is refreshing
A ₁₄	The meals served at the hotel are delicious
B	RELIABILITY
B ₁	Your hotel reservation is handled efficiently and effectively
B ₂	Your booked guestroom is ready as promised
B ₃	The bill is charged accurately
B ₄	All size of servings are given correctly the first time
B ₅	The employees show a sincere interest in solving your problem
B ₆	The hotel insists on error-free records
B ₇	AC, TV, radio, lights, mini bar, & other equipment work properly
B ₈	Overall, you got what you paid for
C	RESPONSIVENESS
C ₁	The employees tell you exactly when services will be performed
C ₂	The employees give you prompt service
C ₃	The employees are always willing to help you
C ₄	The employees are never too busy to respond to your requests
C ₅	Informative literature about the hotel facilities is provided
D	ASSURANCE
D ₁	The employees have knowledge in answering your enquiries
D ₂	The behavior of employees instills confidence in you
D ₃	The employees know well about local places of interest
D ₄	The hotel provides a safe environment
D ₅	The employees are consistently courteous with you
D ₆	The staff explains clearly charges on your account
E	EMPATHY
E ₁	The employees are helpful, friendly, and respectful
E ₂	The hotel gives you individual full attention
E ₃	The hotel has employees who give you personal attention
E ₄	The employees understand your specific needs
E ₅	The hotel has your best interests at heart
E ₆	The hotel has operating hours convenient to you

Appendix C. The significant linear model of Kansei and service attribute performance

Kansei word	Linear model*
Convenience (K ₁)	K ₁ = 1.15+0.462A ₁₃
Attractiveness (K ₂)	K ₂ = -0.029+0.468B ₃ +0.353E ₃
Cleanliness (K ₃)	K ₃ = 0.599+0.677C ₄
Welcomeness (K ₄)	K ₄ = 1.356+0.501A ₁₃
Confidence (K ₅)	K ₅ = 0.853+0.566A ₁₃
Happiness (K ₆)	K ₆ = 0.193+0.721C ₄
Relaxedness (K ₇)	K ₇ = -0.146+0.53C ₄ +0.394E ₆
Peacefulness (K ₈)	K ₈ = 0.823+0.67C ₄
Passion (K ₉)	N/A
Satisfaction (K ₁₀)	K ₁₀ = -0.562+0.439B ₅ +0.456C ₄
Spaciousness (K ₁₁)	K ₁₁ = 1.124+0.544C ₄
Elegance (K ₁₂)	K ₁₂ = 0.525+0.415E ₃ +0.294B ₄
Friendliness (K ₁₃)	K ₁₃ = 1.045+0.586A ₁₃
Modernization (K ₁₄)	K ₁₄ = 1.398+0.446E ₃
Relief (K ₁₅)	K ₁₅ = -0.155+0.439B ₄ +0.398C ₄
Quietness (K ₁₆)	K ₁₆ = 1.235+0.612E ₆

*details of service attributes, see Appendix B.

Appendix D. Adjusted prioritized continuous improvement actions incorporating HOQ

