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INCORPORATING KANSEI ENGINEERING INTO SERVICE QUALITY TOOLS TO IMPROVE THE AIRLINE SERVICES

Abstract: The aviation industry in Indonesia continues to grow rapidly in the recent years. In 2015, ASEAN Open Sky, the policy of liberalization of air transportation in Southeast Asia was applied and opened the airspace between fellow members of ASEAN countries. Kansei Engineering identifies the design elements that could affect to consumers satisfaction. Integrating SERVQUAL and Kano model can characterize the service attributes, and while the service attributes derived from Kansei words has been known, the Quality Function Deployment would be a suitable quality tool and beneficial in the development and to prioritize the service attributes. Integrating those service quality tools can close the gap between perceived qualityof services and also estimate the existing and future emotional needs of customers. This research aims to develop the strategy for Airline X in order to improve their service quality based on the attractive service attributes and affected Kansei words. The result of the research is the action plans to improve the service quality of Airline X, such as: airlines alliances, classes of seats, brand identity, modern information system, and expert consultation.

Keywords: Kansei Engineering, service quality, Kano model, QFD

1. Introduction

The growth of the aviation industry in Indonesia continues to grow rapidly in the recent years. These conditions have never imagined before when land and sea transportation still being the top choices due to low cost. In recent years, with high mobility of the people to move from one place to another in a short time, the air transportation services have replaced the role of land and sea transportation services (Ko, 2016).

In the recent years, a lot of new airlines emerged in Indonesia and Southeast Asia. It is a natural phenomenon, especially with the large population numbers in Indonesia and the magnitude of the aviation market in the country. In 2013, a new airline made by Lion Air Group, Batik Air, did their first flight from Jakarta to Manado. The airline is doing in the same business segment with Airline X, the full services airline. During this time Airline X is the sole authority in Indonesia for the segment. With the entry of Batik Air, believed to be the competition among domestic airlines will be increasingly hard.

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ASEAN Open Sky is the policy of liberalization of air transportation signed by 10 leaders to open the airspace between fellow members of ASEAN countries. ASEAN Open Sky will liberate airline, airport organizer, aviation regulator (ground handling), and Air Traffic Controller (ATC) to organize and expand their selves. At that time, the airline can fly from any countries in Southeast Asia to 5 biggest airports in Indonesia with few restrictions, including Soekarno-Hatta International Airport in Jakarta, Kuala Namu International Airport in Medan, Juanda International Airport in Surabaya, Ngurah Rai International Airport in Denpasar, and Sultan Hassanudin International Airport in Makassar.

With a large aviation market and strong airlines competition in Indonesia and Southeast Asia require Airline X to improve their service quality continuously and increase its market share, moreover Singapore Airlines who secretly dominating the flights between Indonesia and Singapore. Nagamachi and Lokman (2011) stated that a good product is a product that can attract customers' attention and candidates. Customer attention can be diverted to a good product price, form, and function of the product to the customer. The products also have to consider the feelings and emotions of customers, so the impression of use of the product could affect to customer satisfaction (Khalid & Helander, 2006; Sugandini et al., 2017; Badawi et al., 2017; Muafi et al., 2017). Heiens (2000) stated that customer-focused is one of quality strategies to generate business transactions successfully. Hartono and Tan (2011) also stated that product and service will have greater attraction if they are designed to obtain an emotional feeling.

Researchers used Kansei Engineering to identify which design elements that caused a certain perception, but they can't identify which perspective affected to customer satisfaction. Nagamachi (1995) stated that when the service attributes derived from Kansei words has been discovered, the

Quality Function Deployment/QFD would be a suitable tool and beneficial in product and service development processes

Kano model has been considerably applied in the products and services development, such as hotels (Hartono & Tan, 2011) and the property sector (Llinares & Page, 2011). Customer satisfaction can sometimes be increased by improving critical service attributes. Kano model doesn't evaluate the performance of the attributes. Integrating Kano with SERVQUAL can characterize the attributes of the product. Yang (2011) suggested the importance of involving the quality attributes that exceeds consumer desires, which known as attractive attributes. These requirements are criteria for products that have a great influence on how the product can satisfy the customers. Attractive requirements aren't disclosed explicitly nor expected by the customer. The fulfillment of this requirement leads to a more than proportional satisfaction.

Many service quality tools have been extensively used in the service engineering area. A model called SERVQUAL measures the service attribute performance. SERVQUAL model assumes that the relationship between service attribute performance and customer satisfaction is linear, which means that low customer satisfaction result from low attribute performance (Parasuraman et al., 1988). Then Kano model is inserted to categorize the service attributes. This study focuses on attractive service attributes which means the service attributes aren't requested by the consumers. However, if the attractive service attributes are fulfilled, it makes the consumers highly satisfied.

Quality function deployment (QFD) method has been used in quality management for years. It is one of the very effective quality systems tools to fulfill customer requirements and improve customer satisfaction for products or services by translating customer requirements into product or service features (Akao, 1990).

QFD, a method consumers' needs translator into appropriate design requirements helps organizations to determine the priority of actions needs to be taken. Being one of the quality tools, QFD has been defined as "a method for developing a design quality aimed at satisfying the customer and then translating the customer's demands into design targets and major quality assurance points to be used throughout the production phase"

Although there are many quality theories and models to identify customer needs, all are imperfect; that is, each has its own advantages and disadvantages. Particularly, some models cannot indicate accurately in order to determine true customer needs. In the absence of objective measures, companies must also rely on how the effect of service attributes to customer satisfaction and feeling. This makes development of integrated SERVQUAL, Kano Model, and Kansei Engineering as an alternative quality instrument for determining the critical attributes of quality service. In other word, the customers' needs obtained from the integration between SERVQUAL, Kano Model, and Kansei Engineering, i.e. attractive service attributes. This integrated model of those quality toolscan acquire accurate service attributes that promote customer satisfaction and eliminate resource wastage.

Thus, this paper has three main objectives. Firstly, to identify the service attributes of Airline X and the service attributes that is categorized as attractive attributes. The second objective is to identify Kansei words that represent the emotional needs of the consumers and the Kansei words that are affected by the attractive service attributes. Third, to determine the priority of service attributes of Airline X that need to be improved to develop the strategy for Airline X to improve their service quality.

2. Literature review

2.1. Kansei engineering

Nagamachi (1995) argues that Kansei Engineering (KE) method can win over the competitive market. KE aims to develop products by converting consumers' feeling into design elements of the product (Namagachi, 1995; Nagamachi & Lokman, 2011). As an ergonomics-based product development technology, KE incorporates customers' emotions and preferences (*Kansei* in Japanese) with the engineering knowledge. According to Nagamachi and Lokman (2011), Kansei refers to the condition in which knowledge, emotions, and passions are unified.

Schutte et al. (2004) indicated that KE is commonly used in the scope of product development, but Rostlinger and Goldkuhl (1999) proposed that KE can also be applied in the field of services, such as: Llinares and Page (2011) integrated KE and Kano model to evaluate consumer preferences in real estate, Hartono (2012) used KE with a case study on the hotel, Chen et al. (2015) applied KE in designing logistics services, Sukwadi and Willim (2016) utilized Kansei approach to improve online transportation services, and Hsiao et al. (2017) employed KE to design logistics service for cross-border e-commerce. These studies indicated that the use of KE not only be applied in the form of tangible products (goods), but also can be effectively applied in the field of services.

Hartono (2012) stated that Kansei Engineering is a superior method compared to other similar methods. First, KE is able to minimize the subjectivity by building a mathematical model of the response of Kansei through the human senses and the external stimulus. Second, KE is also able to optimize other properties that are not visible. Third, KE is known as a quality framework that has the tools and integrated methods. Fourth, KE has a strong ability to accommodate the trend of the 21[st]century,

namely hedonistic, pleasure, and individualistic. This is why consumers tend to focus more on the emotional impression than the functional usefulness of the product.

2.2. Quality function deployment

Quality function deployment (QFD) is a quality method developed in Japan by Yoji Akao in 1972. The first application of the QFD is by Mitsubishi in Japan in 1972. After a number of development and training for 4 years, QFD successfully implemented in production by Toyota minivans.QFD is a cross-functional planning methodology commonly used to ensure that customer requirements, often referred to as VOC or WHATs, are deployed through product, part, process and production planning (Akao, 1990; Wolniak & Sędek, 2009; Suef et al., 2014). It is defined as a method for translating customer requirements into the

suitable technical requirements at every phase in the product life cycle (Akao, 1990). The overall process of QFD is based on its core matrix framework, called the house of quality, which is used to intertwine customer needs, product design/management requirements, target design goals, and competitive product evaluations.

However, the use of QFD has now been expanded also in the services sector, such as the research conducted by Tan and Pawitra (2001) proposed the integration of Kano and QFD method for service development, Hartono (2012) integrated multiple methods (including KE and QFD) to evaluate the hotel services, Sukwadi (2015) combined SERVQUAL and QFD into Customer Experience Management (CEM) framework, and Lin et al. (2015) integrated *Kano model* into FQFD for Taiwanese Ban-Doh banquet culture.
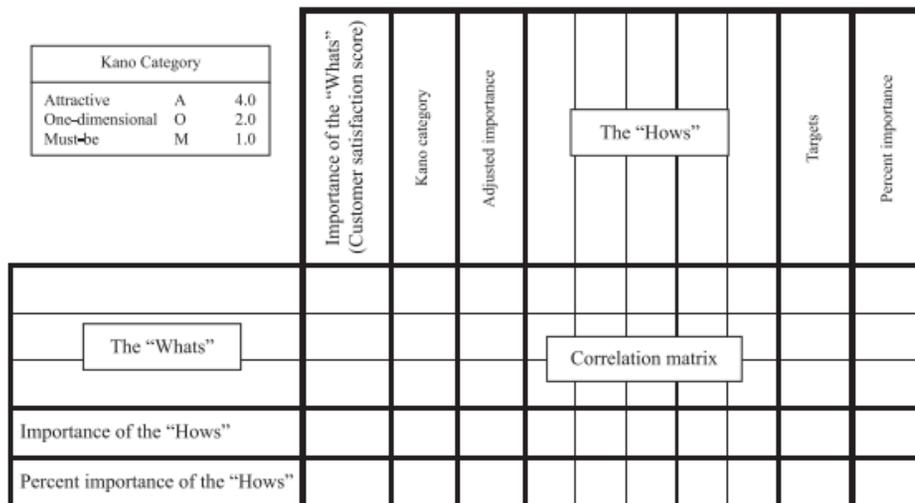

Figure 1. House of Quality (Akao, 1990; Tan & Pawitra, 2001)

To translate the voice of customer into the process of product and service development, a matrix table known as the House of Quality (HOQ) is applied. HOQ structure used in this study is HOQ used by Tan and Pawitra (2001). Figure 1 shows the structure HOQ that is being used.After the parts are

identified, then the importance level of the Hows can be determined. This importance value will be counted as the reference for the organization to allocate its resources on target. The greater the value of this importance level means the design requirements is the priority to develop.

2.3. Kano model

Kano model was first found by Dr. Noriaki Kano at the University of Tokyo Rika. Kano et al. (1984) proposed a model that was inspired from Herzberg's motivator-hygiene model. This model (Table 1) categorizes the attributes of a product or services to determine the level of satisfaction and the level of consumer dissatisfaction. Kano model helps to recognize and to differentiate product requirements that have great impact on the customer satisfaction (Waldenn, 1993). Many researchers (Sukwadi et al., 2012b; Fan et al., 2015; Sukwadi et al., 2016; Violante & Vezzetti, 2017) have applied Kano model to identify the customer latent needs and how product/service feature influences customer satisfaction.

Kano method applies two types of questionnaires; functional questionnaire and dysfunctional questionnaire. Those questionnaires are used to determine the category of an attribute. Functional questionnaire consisted of several questions that indicate the condition when the attribute is supposed to function. Dysfunctional questionnaire consisted of several questions that indicate the condition when the attributes are not functioning as they should.

Kano model classifies the answers of the attributes given to customers based on how it is perceived by the customer to the services given into categories respectively; must-be, one-dimensional, attractive, reverse, and indifferent attributes (Kano et al., 1984). Kano model is a good method to explore the characteristics of customer requirements. By using Kano model, one can define the customer requirements by classifying them into Kano categories and by locating each attribute's requirement on a graph (Figure 2). The basic assumption behind Kano model is that the customer satisfaction is not always proportional to how completely functional the product. The higher quality does not necessarily lead to higher satisfaction for all product or service requirements. An understanding of these categories of quality attributes is fruitful to improving the product quality and in the product development (Yang, 2005).

1) Must-be attributes: adequate quality attributes do not lead to customer satisfaction, but inadequate quality attributes lead to customer dissatisfaction.
2) One-dimensional attributes: adequate quality attributes lead to customer satisfaction, and inadequate quality attributes lead to customer dissatisfaction.
3) Attractive attributes: adequate quality attributes lead to customer satisfaction, but inadequate quality attributes do not lead to customer dissatisfaction.
4) Reverse attributes: inadequate quality attributes lead to customer satisfaction, but adequate quality attributes lead to customer dissatisfaction.
5) Indifferent attributes: adequate quality attributes do not lead to customer satisfaction, and inadequate quality attributes also do not lead to customer dissatisfaction.

Table 1. Kano model categorization

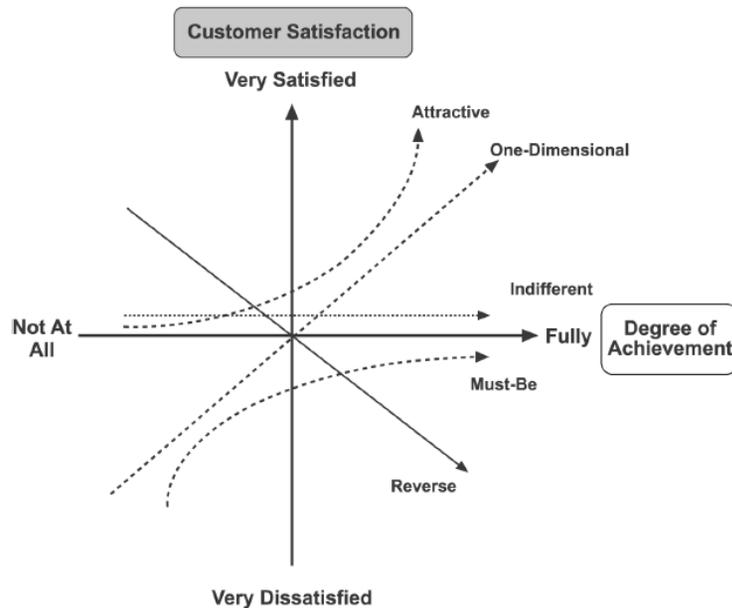| Customer Requirement		Dysfunctional				
		1. like	2.must be	3.neutral	4. live with	5.dislike
Functional	1. like	Q	A	A	A	O
	2. must-be	R	I	I	I	M
	3. neutral	R	I	I	I	M
	4. live with	R	I	I	I	M
	5. dislike	R	R	R	R	Q

Figure 2. Kano Model Graph (Kano *et al.*,1984)

2.4. SERVQUAL

Service quality is a kind of the perception of consumption, which is invisible and versality. It is difficult to evaluate service quality than evaluate products quality (Chen et al., 2007). The SERVQUAL method, developed by Parasuraman et al. (1988) is technique that can be used for performing gap analysis of an organization's service quality performance against customer service quality needs. It is the best-known service quality measurement model (Parasuraman et al., 1991). It is also a multi-item scale developed to assess customer perceptions of service quality in service and retail businesses (Parasuraman et al., 1988).

Service quality (SERVQUAL) model has been used extensively to measure the quality of service. Parasuraman et al. (1988) defined SERVQUAL as a compact tool for measuring the number of items to give good validity and reliability values that can be used to provide a better understanding of the expectations and the value obtained consumers of these services. SERVQUAL is a technique used to diagnose the strengths and weaknesses of an organization's service quality (Tan & Pawitra, 2001). Stefano et al. (2015) stated that any kind of service can have a different service quality determinants. Service quality is affected by consumers' expectations and consumers' perceived service. If the services are perceived as predicted, then the service is satisfactory, and if the perceived service exceeds the expectations of the consumers will be very happy (delighted).

SERVQUAL model applies the gap model between customer perceptions and expectations of service quality to determine perceived service quality. Based on the service quality gaps, company can determine the service quality improvement plans to assess service quality and improve customer satisfaction. Methods such as SERVQUAL have been applied to do customers' satisfaction surveys that replace the expectation values with the importance values. The use of perceived as opposed to actual service received makes the SERVQUAL measure an attitude measure that is related to, but not the same as, satisfaction (Parasuraman et al., 1988).

Assessing service quality using SERVQUAL involves computing the gap between expectation and perception statements (Parasuraman, et al., 1985). For each pair of statements, the SERVQUAL score is computed as follows:

SERVQUAL score = Perception score - Expectation score   (1)

Parasuraman et al. (1985) in the explorative research stated that regardless of the types of service, consumers basically use the similar criterias to evaluate the service qualityreceived. These criteria are divided into 10 key categories called quality service determinants with a 97-item scales. In a subsequent research conducted by Parasuraman et al. (1988), the 10 service quality determinants of service quality is developed to 5 dimensions that cover the 10 dimensions. These five dimensions are tangibles, responsiveness, assurance, reliability, and empathy. Twenty two item scale questions are presented, where the scale used may be a scale of 5 points, 7 points, or 9 points with the format " strongly disagreed" to "strongly agreed" (Likert scale).

Service quality has attracted the interest of researchers and practitioners in the contextof events mainly because of its influence on customer satisfaction (Cronin & Taylor, 1992). Literature review shows that there are many studies related to quality of services, and their effects on customer perceptions applied to various service sectors, such as: banking (Parasuraman et al., 1985; Cronin & Taylor, 1992; Badawi et al., 2017; Muafi et al., 2017), higher education (Sukwadi & Yang, 2012; Sukwadi et al., 2012b), transportation (Sukwadi & Jufina, 2015; Sukwadi & Willim, 2016), health care (Sukwadi et al., 2014; Sukwadi et al., 2016), tourism and hospitality (Sukwadi et al., 2012a; Sukwadi & Yang, 2014; Sukwadi, 2017; Sukwadi et al., 2017; Haryono et al., 2017). It has been observed that service quality model (Figure 3) was commonly used in the majority of those studies.

3. Methodology

3.1. Research design

Firstly, the nominal group technique was used to conduct a panel discussion. The participants included Airline X representatives, researchers, and frequent passengers. At the same time, a total of 20 passengers were randomly interviewed. The interview and discussion material were derived from five SERVQUAL dimensions of service quality suggested by Parasuraman et al. (1988), to measure service quality in airline industry. The purpose of passenger interviews and a panel discussion was to determine the service attributes to be listed in the questionnaire. As a result, 16 service attributes were considered in this research (see Appendix A and B for details). The survey instrument (questionnaires) consisted of three sections: (1) demographic data about respondents, (2) the satisfaction of service attributes in Airline X and its close competitors, and (3) the importance of service attributes. For example, "detailed flight costs", "ease of getting information about the flight", "attractive and modern look cabin". A five-point Likert scale, such as "1 = not very important" to "5 = very important" was used to measure the consumers' perception about each flight service attributes.

3.2. Data collection

This research applied case study with the research object is the services of Airline X. A pilot study of a sample size of 50 was conducted to ensure the user-friendliness of the designed questionnaires. All the customers responding to the questionnaires commented on its readability and ease of understanding. As a result, some amendments in terms of rewording of items were made.

Final questionnaires were utilized to collect the data from the passengers. There were 220 respondents participated in this research

as the minimal sample size is 5-10 times of the number of questions in the questionnaire (Hair et al., 2009). Purposive sampling scheme was used. The respondents are the consumers who have used Airline X at least once since Airline X joined the Sky team alliance in 2014. The respondents are the consumers who used Airline X from the five cities with the largest movement of air passengers in Indonesia so the conclusions can represent the services of Airline X in Indonesia, such as 119 respondents from Soekarno-Hatta International Airport Jakarta, 36 respondents from Juanda International Airport Surabaya, 31 respondents from Ngurah Rai International Airport Denpasar, 20 respondents Sultan Hassanudin International Airport Makassar, and 17 respondents from Kuala Namu International Airport Medan. All data were collected over a period of three months.

This research applied a framework which consists of six main steps as shown in Figure 4. They include initial phase, span the semantic space, span the service attribute space, synthesis, adjust the priority score, and house of quality.
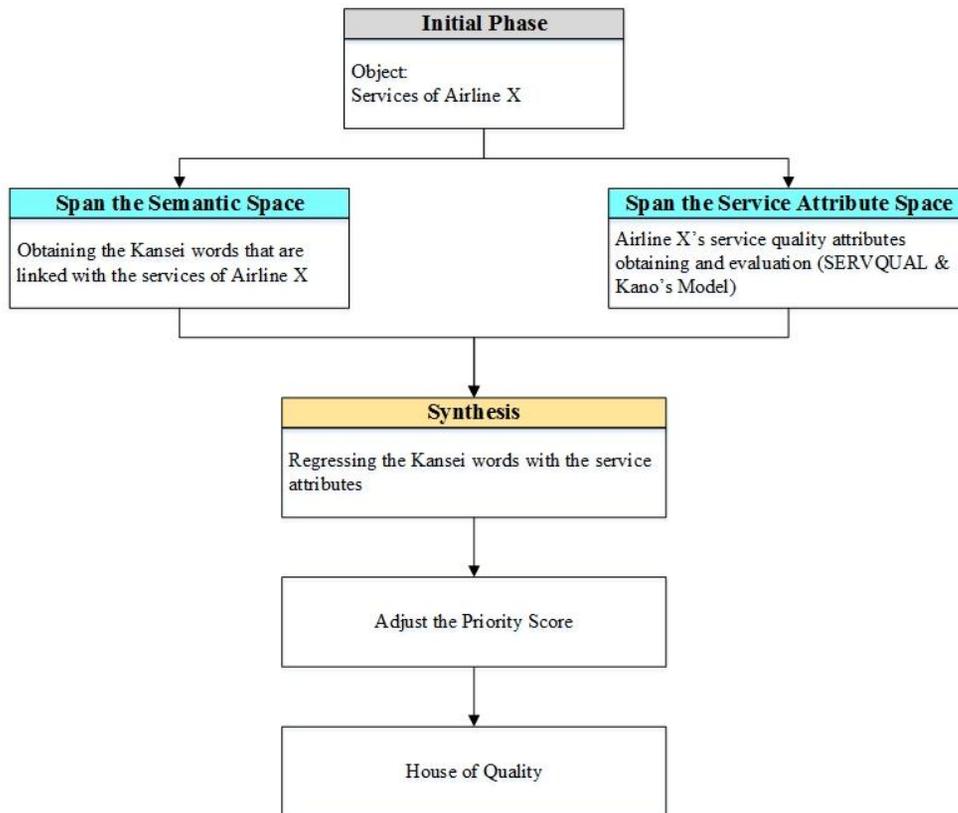
Figure 4. Research framework

Afterwards, the Kano model was inserted through the Kano functional and dysfunctional questionnaire. The service attributes used in Kano questionnaire are obtained from SERVQUAL model. Kano functional questionnaire is when the attribute functioning as it should be and dysfunctional questionnaire indicates when the attributes isn't functioning as it should be. The scale being used is a 5-point-Likert-scale, such as

R. Sukwadi, Muafi, H. Putra Sanjaya

"1 = Very Not Satisfied" to "5 = Very Satisfied". The Kano questionnaire was used to measure the consumers' satisfaction level of the service attributes and to classify each service attributes into attractive, must-be, one-dimensional, indifferent, questionable, or reverse (Hartono & Tan, 2011).

It was continued then to span the semantic space to collect and select the Kansei words. The Kansei words are gathered from various sources. This section is the main focus of this study. There are 15 Kansei words collected and needed to be filled out by respondents, where respondents will fill out the questionnaire in accordance with the experience that is felt after using the services of Airline X. A 5-point-semantic-differential scale is being used, where "1 = Very Negative Kansei" to "5 = Very Positive Kansei". Kansei words include "safe", "clean", "elegant",…,etc. Through the validity and reliability tests using SPSS 23.0, all service attributes and Kansei words were deemed to be valid and reliable (see Appendix C).

4. Results

The chosen Kansei words and the attractive attributes of airline service that have already been obtained from SERVQUAL integration with Kano model were then met and linked together using multiple linear regression analysis (see Appendix D for details). Then, it proceeded to the adjust priority score stage by including the significant models only to determine the order of priority of service attributes to be developed by the number of Kansei words that are affected by the service attributes. A service attribute with the higher number of affected Kansei words and have the most negative gap will be prioritized for improvement. First, the score for each weak attractive service attribute, which called the "adjusted priority score" was determined. The first priority service attribute was given the highest score and the normalized. For example, attribute E5 was given the score of 1. Through normalization, the adjusted priority score became 0.5 (= 3 / [1+2+3]). Second, we adjust the importance level by multiplying the adjusted priority score and importance level. The greater the adjusted importance level, the more important is the service attribute (see Table 2 and Table 3). The action was to propose "continuous improvement" based on the service gap to close the gap between the perception and expectation scores (Hartono, 2012).

Table 2. Prioritized service attributes

	Service Attributes	RelatedKansei Words	Gap	Priority
B1	Airline X has several choices of flight time on every routes	Safe, Roomy, Cool, Punctual	-0.086	2
B3	Friendly flight attendants		0.364	
C2	Cabin cleanliness		0.364	
C3	Services punctuality		0.705	
C4	Neat appearance of flight attendant	Elegant, Roomy, Comfortable, Cool	0.373	
C5	Polite appearance of flight attendant	Safe, Punctual	0.341	
D2	Clear in-flight information		0.327	
D3	Flight attendants give fast services		0.382	
E1	Large cabin space		-0.018	3
E2	In-flight entertainment availability		0.477	
E5	Attractive flight attendants' uniforms	Clean, Elegant, Familiar, Innovative, Attractive, Modern, Comfortable, Fresh, Maintained	-0.073	1
E6	Attractive and modern look cabin		0.736	

The final step was the House of Quality to close the gaps between consumers' expectations and perceptions level (Pawitra & Tan, 2003). House of Quality aims to develop a concrete action that needs to be done to improve the prioritized service attribute through proposed continuous improvement. The "WHATs" are the voices of consumers obtained from the prioritized service attributes. The "HOWs" adopted from various sources, such as Hartono (2012) who given the design requirements for the luxury hotel services, Tolpa (2012) who researched consumer expectations of service quality of the airlines and Wirtz & Johnston (2001) who researched the services of Singapore Airlines. The adjusted prioritized improvement actions incorporated with House of Quality is presented in Table 3 and Appendix E.

Table 3. Adjusted importance level

	Service Attributes	Priority	Score	Adjusted Priority Score	Importance Level	Adjusted Importance Level
B1	Airline X has several choices of flight time on every routes	2	2	0.333	4.495	1.499
E1	Large cabin space	3	1	0.167	4.341	0.724
E5	Attractive flight attendants' uniforms	1	3	0.5	4.368	2.184

5. Conclusions

After collecting and analyzing the data obtained from the consumers of Airline X, not all airline service attributes were considered to be attractive and significant to their Kansei. Kansei is emotional feelings felt by the consumers. Through the analysis of Kano model, there were twelve service attributes considered as attractive, including Airline X has several choices of flight time on every route, friendly flight attendants, cabin cleanliness, service punctuality, neat appearance of flight attendant, polite appearance of flight attendant, large cabin space, in-flight entertainment availability, attractive flight attendants' uniforms, and attractive and modern look cabin.

Through the multiple linear regression of the Kansei words and attractive airline attributes, there were three service attributes deemed attractive and important to consumers' emotional needs, the include Airline X has several choices of flight time on every routes, neat appearance of flight attendant, polite appearance of flight attendant, and attractive flight attendants' uniforms. In supporting what should be prioritized for continuous improvement program, Airline X's manager should be aware of these service attributes. Then the service attributes are adjusted based on negative gap values, which resulted into three service attributes to be improved, Airline X has several choices of flight time on every routes, large cabin space, and attractive flight attendants' uniforms.

Using House of Quality integrated with SERVQUAL, Kano model, and Kansei Engineering methodology, there are five design requirements as the actions needed for the improvement of the service attributes. They are airlines alliances, classes of seats, brand identity, modern information systems, and expert consultation. The airlines alliance very strongly related to the choices of the flight time on every routes of the airline, which the airline should make the codeshare in the alliance become usable and creating a domestic alliance with the subsidiary of the company. The classes of seats is very related to the large cabin space attribute, which the company should adopt more classes of economy classes; premium economy class, comfort economy class, and budget economy class. More specifically, the brand identity

related to attractive flight attendants uniforms where Airline X should retain some elements of traditional dress design for the new "eye-catching" flight attendants' uniform. The modern information systems for the flight time of the airline should be integrated to the other airline in the alliance. Expert consultation is used to design the economy classes and new "eye-catching" uniform.

6. Conclusion and implication

6.1. Conclusion

Based on the data analysis, there are 12 service attributes of Airline X that are categorized as the attractive service attributes; Airline X has several choices of flight time on every routes, friendly flight attendants, cabin cleanliness, service punctuality, neat appearance of flight attendant, polite appearance of flight attendant, large cabin space, in-flight entertainment availability, attractive flight attendants' uniforms, and attractive and modern look cabin. There are three service attributes to be improved based on negative gaps and Kansei feelings; Airline X has several choices of flight time on every route, large cabin space, and attractive flight attendants' uniforms that affecting safe, roomy, cool, clean, elegant, familiar, innovative, attractive, modern, comfortable, fresh and maintained Kansei words.

There are five actions plans for improvement of the service attributes; airlines alliances, classes of seats, brand identity, modern information systems, and expert consultation. The action plans obtained to delight the consumers. Delighting consumers is an essential key achieving consumers' satisfaction with positive impressions (Hartono, 2012; Muafi et al., 2017; Badawi et al., 2017; Sugandini et al., 2017; Muafi, 2016). This research has limitations on the utilized service attributes and Kansei words. In the future research, develop different service attributes and Kansei words for flight

services may be considered. In addition, use different quality tools that can be used to improve the quality of service of the airlines.

6.2. Theoretical implication

Theoretically, this study provides a contribution to the academic literature on service design and development, and quality management by suggesting an integrated model of SERVQUAL, Kano model, Kansei Engineering, and QFD. This study introduces an integrative framework of those four quality models, applied to airline services. The SERVQUAL was applied to identify the critical attributes of airline services. The result of Kano model and Kansei Engineering was used and inserted into QFD to improve airline service based on service attribute category and customer emotional response. Thus, it highlights how emotional needs of customer due to service encounters has been modeled, and fulfilled for any proposed suggestions.

In regards to delight the passengers, airline providers mostly rely on past experiences and existing services. Hence, the integrated model is utilized to resolve this issue during the service and improvement processes. This framework has the potential to generate breakthrough and innovative ideas. It is hoped that the proposed integrated applied model of SERVQUAL, Kansei Engineering, Kano model, and QFD may deliver innovative solutions for airline service design and improvement with regards to passengers' emotional satisfaction.

6.3. Managerial implication

This study shows that services hold great allure if they are attractively designed to evoke emotional feelings from real customers. This integrated model has good potential way to provide a competitive advantage to translate customer emotional feelings intoreal services. Practically, this integrated model has been utilized into airline services. What have been carried out

may provide a practical directive for airline service manager to continuously inquire service improvement strategies.

Practically, this research provides insight on which service attributes merit more deliberation with regard to their significant leverage on customer emotional needs. Apart from cognitive emotions play a substantial role in service encounters. Through a focus on delighting the critical service attributes, this study enables airline manager to establish the extent to which they prioritize their improvement strategies and to always satisfy their customer emotions beyond expectation regarding with airlines alliances, classes of seats, brand identity, modern information system, and expert consultation.

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Appendix A:
Profile of Respondents

Demography	Number of Respondents	Percentage
Gender		
Men	84	38.18%
Wowen	136	61.82%
Ages		
<18 years old	7	3.18%
18 - 29 years old	207	94.09%
30 - 39 years old	2	0.91%
40 - 49 years old	4	1.82%
Last Education		
Others	1	0.45%
Senior High School	146	66.36%
Undergraduate	69	31.36%
Graduate	4	1.82%
Occupation		
Others	9	4.09%
Employees	16	7.27%
Students	187	85%
Entrepreneurs	8	3.64%
Expenses per Month		
<Rp 3.000.000,00	115	52.27%
Rp 3.000.001,00 - Rp 5.000.000,00	74	33.64%
Rp 5.000.001,00 - Rp 10.000.000,00	22	10%
Rp 10.000.001,00 - Rp 20.000.000,00	6	2.73%
>Rp 20.000.000,00	3	1.36%
Frequencies using Airline X		
Once	79	35.91%
2 times	63	28.64%
3 times	30	13.64%
4 times	17	7.73%
More than 4 times	31	14.09%
Respondents' Departure Airports		
Jakarta	116	52.73%
Surabaya	36	16.36%
Denpasar	31	14.09%
Makassar	20	9.09%
Medan	17	7.73%

Appendix B:
Service Attributes of Airline X&Kansei Words

No	Service Attributes
A	**ASSURANCE**
A1	Detailed flight costs
A2	Clear pre-flight information
A3	Flight punctuality
A4	Safe feeling while using Airline X
B	**EMPATHY**
B1	Airline X has several choices of flight time on every routes
B2	Flight attendants always offering help when we have trouble
B3	Friendly flight attendants
C	**RELIABILITY**
C1	Fees paid in accordance with the services provided
C2	Cabin cleanliness
C3	Services punctuality
C4	Neat appearance of flight attendant
C5	Polite appearance of flight attendant
D	**RESPONSIVENESS**
D1	Ease of getting information about the flight
D2	Clear in-flight information
D3	Flight attendants give fast services
D4	Flight attendants always willing to help and don't seem busy

Kansei words

No	Kansei Words
1	Safe
2	Clean
3	Elegant
4	Familiar
5	Innovative
6	Roomy
7	Attractive
8	Modern
9	Comfortable
10	Friendly
11	Neat
12	Fresh
13	Cool
14	Punctual
15	Maintained

Appendix C:
Validity and reliability tests

Service Attributes No	Pearson Correlation			r Table	Description
	SERVQUAL	Kano Functional	Kano Dysfunctional		
A					
A1	0.762	0.522	0.65	0.133	Valid
A2	0.916	0.538	0.715	0.133	Valid
A3	0.384	0.68	0.789	0.133	Valid
A4	0.496	0.55	0.699	0.133	Valid
B					
B1	0.681	0.421	0.753	0.133	Valid
B2	0.873	0.736	0.789	0.133	Valid
B3	0.52	0.592	0.753	0.133	Valid
C					
C1	0.595	0.672	0.743	0.133	Valid
C2	0.366	0.526	0.607	0.133	Valid
C3	0.658	0.333	0.511	0.133	Valid
C4	0.681	0.483	0.671	0.133	Valid
C5	0.873	0.578	0.735	0.133	Valid
D					
D1	0.735	0.786	0.841	0.133	Valid
D2	0.71	0.506	0.818	0.133	Valid
D3	0.664	0.559	0.796	0.133	Valid
D4	0.58	0.715	0.784	0.133	Valid
E					
E1	0.55	0.578	0.749	0.133	Valid
E2	0.71	0.492	0.632	0.133	Valid
E3	0.664	0.753	0.804	0.133	Valid
E4	0.427	0.615	0.74	0.133	Valid
E5	0.681	0.509	0.643	0.133	Valid
E6	0.873	0.505	0.702	0.133	Valid

Reliability test

Questionnaire	Cronbach's Alpha
SERVQUAL	0.756
Kano Functional	0.748
Kano Dysfunctional	0.761
Kansei	0.773

Appendix D:
Result of multiple linear regression of Kansei and service attributes

Regression Model	Variables	Linear Regression
1	B1, C5	$K_1 = 1.747 + 0.185 B_1 + 0.303 C_5$
2	E5	$K_2 = 1.293 + 0.262 E_5$
3	C4, E5	$K_3 = 1.327 + 0.165 C_4 + 0.147 E_5$
4	E5	$K_4 = 1.637 + 0.135 E_5$
5	E5	$K_5 = 1.162 + 0.282 E_5$
6	B1, C4	$K_6 = 1.372 + 0.177 B_1 + 0.214 C_4$
7	E5	$K_7 = 1.224 + 0.225 E_5$
8	E5	$K_8 = 1.293 + 0.262 E_5$
9	C4, E5	$K_9 = 1.327 + 0.165 C_4 + 0.147 E_5$
10		
11		
12	E5	$K_{12} = 1.060 + 0.287 E_5$
13	B1, C4	$K_{13} = 1.379 + 0.177 B_1 + 0.012 C_4$
14	B1, C5	$K_{14} = 1.747 + 0.185 B_1 + 0.303 C_5$
15	E5	$K_{15} = 1.168 + 0.264 E_5$

R. Sukwadi, Muafi, H. Putra Sanjaya

Appendix E: Adjusted prioritized & house of quality

		HOWs	Adjusted Importance Level	Airlines alliances	Frequent-flyer programs	Pre-flight services	Training the front-line	Classes of seats	Consumers' complaints	Brand Identity	Rebate offers	Insurance offers	Modern Information Systems	Expert consultation	Personnel Management	General Affairs Management	Percentage of Importance Level of WHATs
	WHATs			1	2	3	4	5	6	7	8	9	10	11	12	13	
B1	The airline has several choice of flight time on every route	1	1.499	●									●				34.01
E1	Large cabin space	2	0.724					●	o					●			16.43
E5	Attractive flight attendant's uniforms	3	2.184							●				o			49.56
Importance of the HOWs				13.49				6.516	2.172	13.49			13.49	13.07			
Percentage of Importance Level of HOWs				21.68				10.47	3.49	21.68			21.68	21			

R. Sukwadi, Muafi, H. Putra Sanjaya