

## HOW KANSEI ENGINEERING, KANO AND QFD CAN IMPROVE LOGISTICS SERVICES

Markus Hartono<sup>1\*</sup>, Amelia Santoso<sup>1</sup>, Dina Natalia Prayogo<sup>1</sup>

<sup>1</sup>*Department of Industrial Engineering, Faculty of Engineering, University of Surabaya, Surabaya 60293, Indonesia*

(Received: January 2017 / Revised: June 2017 / Accepted: October 2017)

### ABSTRACT

In the period of 2004 to 2014 there was a significant growth of employment in the logistics sector in Indonesia. This reflects a rapid rise in the need for logistics activities to support outsourcing. Because there is strong competition in the sector, logistics services should be able to deliver both cognitive and affective customer satisfaction. Studies in logistic services have been mainly focused on service gaps, an aspect related to cognitive satisfaction in customers. Many studies have been conducted to evaluate logistics service quality using SERVQUAL and the Kano model. However, these are insufficient in addressing all aspects of logistics provision. Hence, a deep understanding of customer affective need (known in Japanese as Kansei) is required, to provide competitive advantage by modeling more comprehensive customer experiences based on perceived logistics services. This paper proposes a combined model of Kansei Engineering, Kano, and quality function deployment (QFD), which it is hoped will generate more innovative ideas for improvements related to customer emotional satisfaction and customer delight. A case study in supporting logistics services has been chosen to validate the proposed model, and a survey through face-to-face questionnaires involving 157 customers was carried out. The model was then validated, and through the House of Quality (HoQ) concept, some innovative improvement ideas are proposed. They include the use of apps for order confirmation and cancellation, the integration of Google Maps into the ordering system, pre-order booking, and a bilingual feature in the transaction menu. Thus, from a practical implication point of view, it is hoped that this study will provide guidelines to the managers of logistics services companies in capturing, measuring and analyzing customer emotional needs (Kansei), with respect to the service attributes which are highly significant to Kansei aspects.

*Keywords:* Kano; Kansei Engineering; Logistics; QFD; Services

### 1. INTRODUCTION

Customer loyalty will be indirectly affected by perceived service quality because of the impact such quality has on the satisfaction that in turn creates loyal customers. Service quality can be considered as a composite of multiple service attributes categorized as tangible or intangible/subjective (Stefano et al., 2015). The assessment of service quality can be performed by investigating the gap between perceived quality and customer expectation, through a research tool known as SERVQUAL (Parasuraman et al., 1988). SERVQUAL has been used extensively since the 1990s, particularly in the service domain. The common dimensions of service captured by SERVQUAL are tangibles, reliability, responsiveness, assurance and empathy.

---

\*Corresponding author's email: markus@staff.ubaya.ac.id, Tel: +62-31-2981392, Fax: +62-31-2981151  
Permalink/DOI: <https://doi.org/10.14716/ijtech.v8i6.689>

One of the emerging service sectors is logistics, especially logistics. According to Chen et al. (2015), this type of service can add great value to customers and companies. There are three principal aspects to logistics services for customers: package pick-up, tracking, and delivery services, and these services may play a critical part in leveraging the effectiveness and efficiency of the physical distribution and online transactions of goods, and even of services (Hsu et al., 2011).

Service experiences start and end with human beings, with the meeting of customer needs at the beginning of the process being completed by customer satisfaction and loyalty at the end. Research exploring human involvement in service encounters is less common than other types of research (Drury, 2003). Both the 'servicescape' and interactions between customers and employees will build service satisfaction. In other words, it is said that processes, activities and interactions are more important in service experiences than are things (Lovell, 1991; Vargo & Lusch, 2004). In terms of human-based interactions, service experiences will produce both cognitive and affective satisfaction (Wong, 2004; Hartono & Tan, 2015).

In obtaining a competitive advantage with respect to customer behavior, those delivering services should put more effort into integrating human factors into service design (Abrams et al., 2004). The scope of human factors known as ergonomics covers physical and psychological human behaviors, environments, products, and services (Chen et al., 2015). Inherently, the concept of ergonomics has been significantly extended from its original approach related to physical products into service design. Hence, the service provider needs to understand what customers expect and how they perceive the services they receive (Cook et al., 2002).

Products and services are deemed to be successful when they can produce happiness in customers or users (Norman, 2004). Moreover, it is hoped that emotional satisfaction can go beyond just the usability and functionality of products (Helander & Khalid, 2006; Hartono & Raharjo, 2015). In dealing with, capturing and modeling customer emotional needs into service design and development, it is proposed that the concepts of Kansei Engineering (KE) can be employed (Nagamachi, 1995; Schütte, 2005; Hartono & Tan, 2011). Since the 1970s, Kansei has been the dominant ergonomic-based product design development, aiming to put emotions into its core concept, and later to quantify them into design specifications (Nagamachi, 1995).

According to Chen et al. (2015), KE has been applied to the design of physical products such as architectural interiors and exteriors, consumer goods, mobile phones, and even sports shoes. Recent research on KE has demonstrated its applicability for self-monitoring blood glucose applications (Dewi et al., 2017) and, in the Indonesian context, designing 4×2-wheel-drive passenger car exteriors (Yogasara & Valentino, 2017). In general, designers use Kansei terms to represent emotional needs which have been translated into product elements. However, the use of KE in services is deemed to be limited, but its application into services may cover delivery and installation of internet services (Nishino et al., 1999), hotel services (Hartono & Tan, 2011), restaurant services (Hartono, 2016a), and logistics services (Chen et al., 2015). One of the advantages of KE is its ability to show the interactive relationship between design characteristics and emotional responses, thus establishing a quantitative framework.

KE has been applied to logistics services as one of the emerging service types, as shown in research by Chen et al. (2015). Recent research into KE in logistics services has been carried out by exploring the quantitative relationship between the feelings (based on Kansei terms) and design elements in home delivery services. This research has shown that when the most important design elements are connected to critical feelings, improvements can emerge. However, in terms of efficiency, the study by Chen et al. (2015) can be strengthened and extended by incorporating potential quality tools, such as the Kano model and QFD. According to Hartono (2012), the use of the Kano model and QFD in Kansei methodology research may

provide a formal methodology which accounts for customer emotional needs in service design. Hence, this study of KE integrated with the Kano model and QFD in logistics services is proposed. Kano will help with the screening process to identify which service attributes are categorized as one-dimensional (O) and attractive (A), aspects which are critical to Kansei, while QFD will finalize the weighted, prioritized service attributes to be improved using the House of Quality (HoQ) (Hartono & Tan, 2011).

Thus, the objective of this study is to develop a conceptual framework applied to logistics services combining KE, Kano and QFD concepts, and to conduct an empirical study of IT-based logistics services to test the applicability of the proposed model. The details of the advantages of this integrative framework compared to the individual methods are summarized in Table 1.

Table 1 Comparison between the individual methods and the proposed integrative framework

Individual method	Proposed integrative framework
<p><b>KE</b> is used as a bridge between Kansei and service experience; it is a methodology to translate customer emotional feelings into service characteristics. However, it <b>lacks</b> information about which service attributes are important and most urgently need to be addressed.</p> <p>The <b>Kano model</b> sorts service performance into three main categories: attractive (A), one-dimensional (O), and basic/must-be (M) qualities. However, it <b>lacks</b> information about which service attributes are sensitive to particular Kansei.</p> <p><b>QFD</b> translates customer needs into product or service elements/characteristics. However, it <b>lacks</b> information on customer needs (for instance, customer emotional needs/Kansei) and a weighting scale formulation.</p>	<p>To overcome the defined deficiencies, an <b>integrative framework</b> combining KE, Kano and QFD has been proposed. This framework <b>links</b> sensitive or urgent customer emotional needs (known as Kansei) with service attributes experience, and <b>prioritizes</b> which service attributes are to be improved, taking into account their impact on Kansei.</p>

With regard to the details of the proposed approach shown in Table 1, the expected contribution of this current study, as contrasted to the previous research on Kansei, is that it will complete the broader application of KE in the different setting of logistics services. The use of QFD accompanied by a Pareto diagram is expected to explore and consider more practical solutions based on current best practice improvements.

## 2. LITERATURE REVIEW

### 2.1. KE in Services

Referring to Nagamachi (1995) and Nagamachi and Lokman (2011), research into KE ranges from physical products to customer service (known as Kansei quality management). Essentially, the core benefit gained is the same in whichever sector is reviewed, that is, the focus on starting and ending any process with customer emotional needs. More specifically, research into KE in services has been introduced and applied to hotels (Hartono & Tan, 2011; Hartono & Raharjo, 2015), restaurants (Hartono, 2016a), and even to interior design (Linares & Page, 2011). By embracing current issues of sustainability, KE has been extended to tackle today's organizational problems. The most recent research on KE, in which a more efficient approach has been addressed, is an extended model of KE, Kano and the *Teoriya Resheniya Izobretatelskikh Zadach* (TRIZ) intended to solve some potential contradictions in solutions (Hartono, 2016a). KE, then, has been extended to cover sustainability issues relating to environmental, economic, and social elements. In term of the research gap identified, a short

summary of KE research on services published between 2011 and 2017 is provided in the matrix in Table 2.

Table 2 Recent research on KE applied in services

Author(s)	Concerns, tools, and methods						
	General KE	SERVQUAL	Kano	TRIZ	Culture	Sustainability	Logistics
Llinares & Page, 2011	√		√				
Hartono & Tan, 2011	√	√	√				
Hartono, 2012	√	√	√				
Rasamoelina et al., 2013	√						
Hartono et al., 2013	√	√	√		√	√	
Hartono, 2014	√	√	√				
Hartono & Raharjo, 2015	√	√	√		√		
Chen et al., 2015	√						√
Hartono, 2016a	√	√	√	√	√		
Hartono, 2016b	√	√	√	√		√	
Current research	√	√	√				√

From Table 1 it can be seen that this current research is positioned where KE may contribute to the field of logistics services (in this case, third party logistics, or 3PL) using general KE methodology integrated with SERVQUAL and the Kano model. The choice of the logistics field is hoped to generate a practical contribution to today's trends in services.

## 2.2. The Kano Model in Services

According to Hartono and Tan (2011), the Kano model is deemed to strengthen KE methodology by providing a guideline of how customers rate their satisfaction with perceived services, either as one-dimensional/linear satisfaction or as attractive/delighted satisfaction (Kano et al., 1984). Such aspects are related to Kansei (Hartono & Tan, 2011). One-dimensional satisfaction provides a linear relationship between product characteristics fulfillment and satisfaction level, whereas attractive/delighted satisfaction will relate more to latent or unspoken needs. Once this type of need is fulfilled, it can generate unpredicted levels of satisfaction. If they are not met only normal satisfaction will be felt. More specifically, such aspects go beyond usability and satisfaction and it is predicted that delighted customers will have an emotional bonding with a particular service provider.

## 2.3. The SERVQUAL Model and Logistics Services

In this study, the service quality for logistics services is modeled and measured by SERVQUAL (see Parasuraman et al. (1988) for details), which consists of five dimensions (tangibles, reliability, responsiveness, empathy, and assurance). SERVQUAL scales will serve as the measurement instrument of perceived and expected services. Overall, logistics service quality covers comprehensive activities ranging from order receipt to delivery to the customer.

In looking at logistics services, one of the most interesting aspects for research is home delivery services, as has been carried out by Chen et al. (2015). Another interesting type, which is becoming a global trend, is that of the logistics service provider or 3PL. Third party logistics is deemed to occupy a critical position in the supply chain for international and domestic trading. From the customers' point of view, Franceschini and Rafele (2000) state that logistics services can be measured in terms of lead-time, regularity, reliability, flexibility, preciseness, harmfulness and productivity. This current research looks 3PL which can be scaled and customized to customer needs such as the level of demand, and delivery service requirements. It may cover products/goods, personal services, and several other types of service. In other words, 3PL may go beyond logistics to include value-added activities.

### 3. FRAMEWORK DEVELOPMENT AND RESEARCH METHODOLOGY

#### 3.1. Framework Development

Based on the research background and KE research in services, a research framework of KE incorporating Kano and QFD is developed (as shown in Figure 1). The framework starts with the problems faced by a particular logistics services company, and then spans the Kansei terms (as the response variables) and perceived service attribute performance (functioning as the predictor variables). Concurrently, a Kano categorization process is conducted to filter the one-dimensional and attractive performance indicators (O and A categories) which are sensitive to Kansei. By generating a linear model the development continued with the calculation of satisfaction scores (see Tan & Pawitra, 2001), and prioritized improvement for particular service attribute(s) is defined. This process is then completed with investigation into how to generate design specification(s) through the application of the QFD HoQ process.

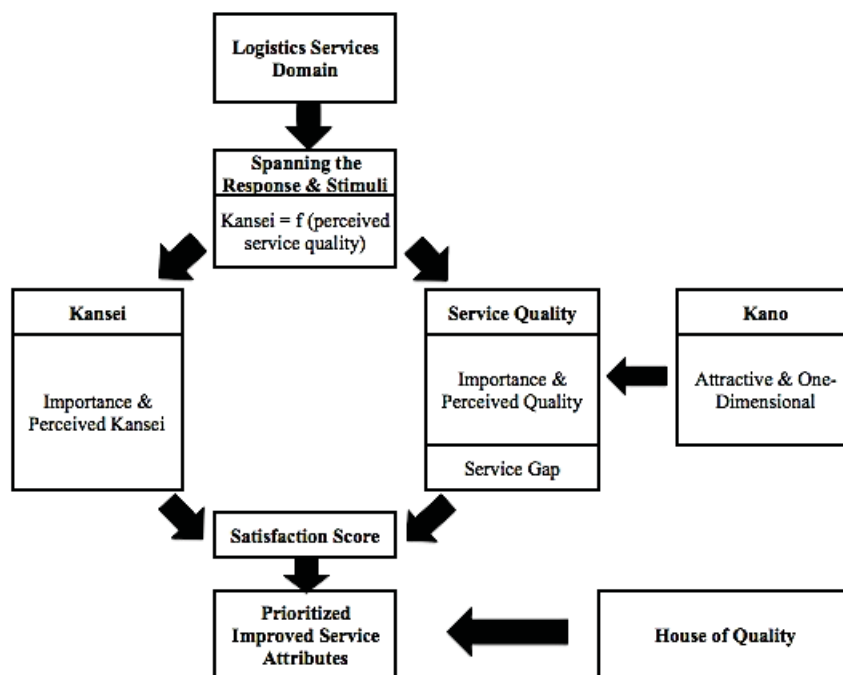


Figure 1 The framework of KE, Kano and QFD for logistics services

#### 3.2. Research Methodology

By adopting the methodology proposed by Hartono (2016a; 2016b), this study utilizes a survey approach through a face-to-face questionnaire, convenience sampling plan, and involving a specific target of respondents for particular logistics services. Those who had experienced logistics services from XYZ company at least twice within a year were selected as potential subjects. Items in the questionnaire were devised based on the literature review, interviews with actual users, and personal observation.

### 4. CASE STUDY OF IT-BASED APPLICATION LOGISTICS SERVICES

A case study of IT-based application-supporting logistics services in Surabaya known as XYZ was carried out. XYZ is also known as a hyperlocal transport service that uses motorcycles. The study involved 157 respondents who had those experienced the services of XYZ over the period August–October 2016. Of the respondents 54% were female and 46% male, with a majority (55%) aged from 16 to 25 years, followed by 26–35 years (27%), 36–45 years (14%), and



above 45 years (4%). Most of the respondents were college students (39%), followed by professionals (31%), entrepreneurs (17%), with the remainder being homemakers.

In terms of the discrepancy between the perceived and expected logistics services, the service gap was calculated for each of the logistics service attributes (as shown in Table 3). Then, in order to confirm that the gap was significant, a t-test for comparing two sample means was carried out. The results of the t-test are also provided in Table 3. The results show that, in all service attributes,  $H_0$  was rejected. This means that, for all logistics service attributes, the perceived service received was poorer than the expected service. The customers felt that what they had received did not match with what they expected.

Table 3 The statistical test for logistics service gap

No	Logistics service attributes	Gap*	t <sub>value</sub>	p <sub>value</sub>	< / >	α	Remark
Tangibles (T)							
1	Vehicle type	-0.56	-7.733	0.000	<	0.05	H <sub>0</sub> rejected
2	Cleanliness of vehicle	-0.86	-11.852	0.000	<		H <sub>0</sub> rejected
3	Driver performance	-0.65	-8.664	0.000	<		H <sub>0</sub> rejected
4	Completeness of driver's attributes	-0.76	-9.390	0.000	<		H <sub>0</sub> rejected
5	Driver rating score	-0.37	-4.984	0.000	<		H <sub>0</sub> rejected
6	Web-based application interface	-0.39	-4.804	0.000	<		H <sub>0</sub> rejected
7	Cleanliness of helmet for customer	-1.27	-15.092	0.000	<		H <sub>0</sub> rejected
8	Provision of mask	-1.25	-14.352	0.000	<		H <sub>0</sub> rejected
9	Food receipt	-0.66	-8.399	0.000	<		H <sub>0</sub> rejected
10	Appearance of foods ordered	-0.90	-10.524	0.000	<		H <sub>0</sub> rejected
Empathy (E)							
11	Provision of apology about any mistakes	-0.71	-7.853	0.000	<	0.05	H <sub>0</sub> rejected
12	Confirmation of any unavailability of orders	-0.74	-9.432	0.000	<		H <sub>0</sub> rejected
13	Confirmation of any cancellations	-0.97	-12.590	0.000	<		H <sub>0</sub> rejected
Responsiveness (R)							
14	Friendliness of driver	-0.66	-8.758	0.000	<	0.05	H <sub>0</sub> rejected
15	Politeness of driver	-0.82	-11.067	0.000	<		H <sub>0</sub> rejected
16	Promptness of delivery	-1.01	-11.221	0.000	<		H <sub>0</sub> rejected
17	Confirmation of any orders made	-0.47	-5.543	0.000	<		H <sub>0</sub> rejected
18	Knowledge of driver of interesting places	-0.99	-12.256	0.000	<		H <sub>0</sub> rejected
Reliability (Re)							
19	Accuracy of payment	-0.78	-9.349	0.000	<	0.05	H <sub>0</sub> rejected
20	Accuracy of driver identity	-0.79	-9.831	0.000	<		H <sub>0</sub> rejected
21	Accuracy of promotions	-0.55	-7.361	0.000	<		H <sub>0</sub> rejected
22	Accuracy of orders	-0.81	-10.925	0.000	<		H <sub>0</sub> rejected
23	Safety	-0.87	-13.978	0.000	<		H <sub>0</sub> rejected
Assurance (A)							
24	Driver traceability	-0.81	-10.000	0.000	<	0.05	H <sub>0</sub> rejected
25	Warranty for orders	-0.67	-7.578	0.000	<		H <sub>0</sub> rejected
26	Privacy for customer	-0.76	-9.630	0.000	<		H <sub>0</sub> rejected

\*the difference between perceived and expected service

The perceived logistics services influenced particular Kansei (i.e. aspects of emotional satisfaction). In this study, the following ten Kansei were identified, formalized and measured: helped (mean = 4.09), trusted (mean = 3.93), secured (mean = 3.91), comfortable (mean = 3.85), innovative (mean = 3.83), friendly (mean = 3.79), precise (mean = 3.70), professional (mean = 3.57), prompt (mean = 3.44) and cheap (mean = 3.32). The distribution of perceived Kansei scores is shown in Figure 2. It shows that Kansei "helped" has the highest perceived score, meaning that, in general, customers felt "helped" when they received logistics services from company XYZ.

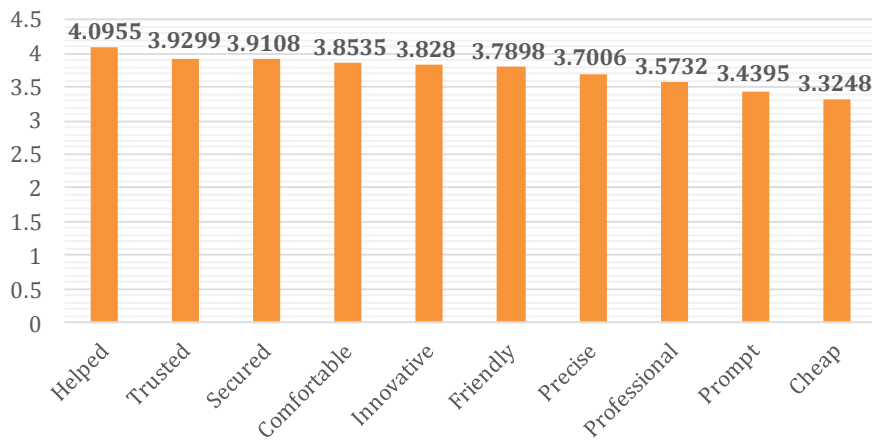


Figure 2 Distribution of perceived Kansei in logistics services

Then, through the Kano categorization process with respect to attractive (A) and one-dimensional (O) categories, aspects of the logistics service the Kansei attributes relate to were identified. They were then connected to significant Kansei through a linear model test, to calculate satisfaction scores relating to them. In line with Hartono and Tan (2011), the importance weighting was determined by incorporating the value of the satisfaction score, the Kano weight (see Tan & Pawitra, 2001), and the Kansei score. The higher the importance weight, the more important the service attribute is. The results are shown in Table 4.

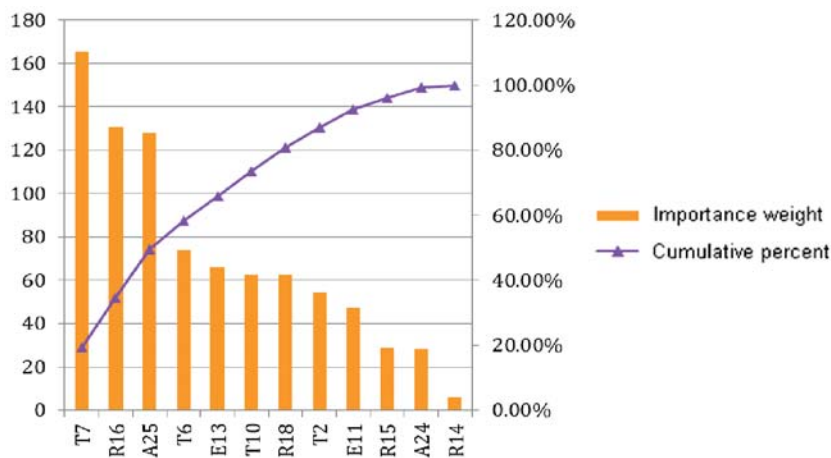


Figure 3 The Pareto chart of logistics service attributes based on importance weight

From the Pareto chart shown in Figure 3 it can be seen that there were seven logistics service attributes deemed to be critical: T7 (cleanliness of helmet for customer), R16 (promptness of delivery), A25 (warranty for orders), T6 (web-based application interface), E13 (confirmation for any cancellations), T10 (appearance of foods ordered) and R18 (knowledge of driver of any interesting places). Using the HoQ method, some related design specifications (known as metrics) were formalized, as shown in Figure 4. It can be seen that the most critical improvement idea was the provision of a modular system for helmets (inside and outside parts) for the customer.

Table 4 The importance weight of logistics service attributes

No	Code	Logistics service attributes	Satisfaction score *	Kano weight	Kansei score	Importance weight**
1	T2	Cleanliness of vehicle	3.47	A 4	Secured 3.91	54.27
2	T6	Web-based application interface	1.58	A 4	Friendly 3.79 Innovative 3.83 Helped 4.09	74.00
3	T7	Cleanliness of helmet for customer	5.73	O 2	Professional 3.57 Innovative 3.83 Cheap 3.32 Precise 3.70	165.25
4	T10	Appearance of foods ordered	3.84	A 4	Helped 4.09	62.82
5	E11	Provision of apology for any mistakes	3.06	A 4	Comfortable 3.85	47.12
6	E13	Confirmation for any cancellations	4.16	O 2	Helped 4.09 Comfortable 3.85	66.07
7	R14	Friendliness of driver	2.95	O 2	-	5.90
8	R15	Politeness of driver	3.69	O 2	Trusted 3.93	29.00
9	R16	Promptness of delivery	4.52	A 4	Friendly 3.79 Prompt 3.44	130.71
10	R18	Knowledge of driver of interesting places	4.24	A 4	Precise 3.70	62.75
11	A24	Driver traceability	3.44	O 2	Helped 4.09 Trusted 3.93	28.14
12	A25	Warranty for orders	2.74	A 4	Secured 3.91 Comfortable 3.85	128.12

\*|satisfaction score| = (perceived – expected) x importance level of service

\*\*importance weight = |satisfaction score| x Kano weight x Kansei score

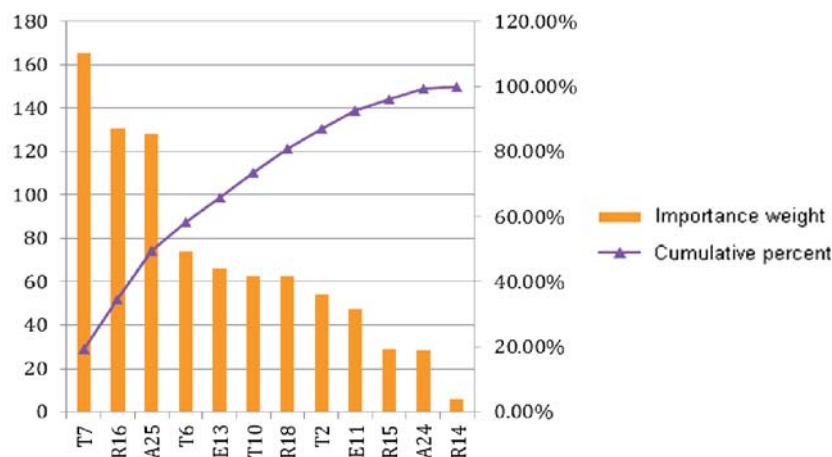


Figure 3 The Pareto chart of logistics service attributes based on importance weight

From the Pareto chart shown in Figure 3 it can be seen that there were seven logistics service attributes deemed to be critical: T7 (cleanliness of helmet for customer), R16 (promptness of delivery), A25 (warranty for orders), T6 (web-based application interface), E13 (confirmation for any cancellations), T10 (appearance of foods ordered) and R18 (knowledge of driver of any interesting places). Using the HoQ method, some related design specifications (known as



metrics) were formalized, as shown in Figure 4. It can be seen that the most critical improvement idea was the provision of a modular system for helmets (inside and outside parts) for the customer.

WHAT(s)	Attribute	Importance weight	HOW(s)						
	T7	165.25	9						
	R16	130.71		9			3		
	A25	128.12			9		3		
	T6	74.00				9			3
	E13	66.07			3		9		
	T10	62.82						9	
	R18	62.75							9
Total weight			1487.25	1176.39	1351.29	666	1371.12	565.38	786.75
Percentage			<b>20.09%</b>	15.89%	18.25%	8.99%	18.52%	7.64%	10.63%

Figure 4 Simple form of HoQ for IT-based logistics services improvement

### 5. DISCUSSION

This study was carried out as an extension of previous research on KE, Kano and QFD applied in services (see Hartono et al., 2013). By looking at logistics services, this study hoped to contribute to the efficiency of logistics performance. The field of logistics services is becoming a potential niche for businesses to explore. There was a huge market growth in logistics in Indonesia in the years 2004 to 2014, and it is still becoming larger due to the growth of infrastructure and economic development. Moreover, with respect to the customer’s point of view, 3PL was chosen since these kinds of services can add a great deal of value to customers and companies (Chen et al., 2015).

This study has been conducted to support the potential development of emotional-based service quality tools, and the potential needs of 3PL services. It proposes a framework of KE, Kano and

QFD applied to a popular IT-based supporting logistics service in Surabaya which provides logistical services for foods, documents and passengers.

From the research findings, it has been shown that the attribute “cleanliness of helmet for customer” was most important, with a significant correlation with the Kansei terms “professional, innovative, cheap, and precise”. Given limited time, effort, budget or other resources, the company should focus more effort on the cleanliness of helmets and supporting facilities in order to gain more customer emotional satisfaction. However, the Kansei term “helped” was the highest-rated emotion experienced by the customers. This was influenced by the performance of the attributes “web-based application interface”, “appearance of food ordered”, “confirmation for any cancellations”, and “driver traceability”. In other words, in general, the customers felt helped once they were served by the XYZ company.

It is also suggested that a modular system for the helmet (inside and outside parts) be considered. This was deemed to be the most important improvement, followed by the provision of application software to give comments and ratings anonymously, and also the use of application software for confirmation and cancellation.

## 6. CONCLUSION

This study promotes the importance of the role of human factors, especially Kansei, in influencing the efficiency and effectiveness of logistics service design and development. The integrated model of KE, Kano and QFD devised provides understanding of what should be considered and executed by the service manager or provider in improving the services offered, while focusing on prioritized solutions, given limited resources. In this study, the improvement of the helmet system, and the provision of application software for submitting comments and ratings and carrying out confirmations/cancellations were rated as high priorities.

This study was limited by a relative small sample size, and a specific IT-based logistics services. Since the proposed model is intended as a general model for the improvement of logistics services, more empirical studies are required. Moreover, the exploration of another part of the logistics services sector is needed; not only 3PL which focus on the end customer, but also on more upstream entities.

## 7. ACKNOWLEDGEMENT

This study on model development and its application to logistics services was fully supported by a research grant under the scheme of applied product with a contract number of 22/SP-Lit/LPPM-01/Dikti/FT/V/2017, endorsed by the Directorate of Higher Education, the Ministry of Research, Technology, and Higher Education, Republic of Indonesia. Also, it was partially supported by the Department of Industrial Engineering, University of Surabaya, Indonesia.

## 8. REFERENCES

- Abras, C., Maloney-Krichmar, D., Preece, J., 2004. User-centered Design. *In: Bainbridge, W. (Ed.), Encyclopedia of Human-computer Interaction*. Sage Publications, Thousand Oaks
- Chen, M-C., Hsu, C-L., Chang, K-C., Chou, M-C., 2015. Applying Kansei Engineering to Design Logistics Services: A Case of Home Delivery Service. *International Journal of Industrial Ergonomics*, Volume 48, pp. 46–59
- Cook, L.S., Bowen, D.E., Chase, R.B., Dasu, S., Stewart, D.M., Tansik, D.A., 2002. Human Issues in Service Design. *Journal of Operations Management*, Volume 20(2), pp. 159–174
- Dewi, D.S., Irfoni, A.R., Rahman, A., 2017. Kansei Engineering Approach for Designing a Self-monitoring Blood Glucose Application. *International Journal of Technology*, Volume 8(2), pp. 272–282

- Drury, C.G., 2003. Service, Quality, and Human Factors. *AI & Society*, Volume 17(2), pp. 78–96
- Franceschini, F., Rafele, C., 2000. Quality Evaluation in Logistic Services. *International Journal of Agile Management Systems*, Volume 2(1), pp. 49–53
- Hartono, M., Tan, K.C., 2011. How Kano Model Contributes to Kansei Engineering in Services. *Ergonomics*, Volume 54(11), pp. 987–1004
- Hartono, M., 2012. Incorporating Service Quality Tools into Kansei Engineering in Services: A Case Study of Indonesian Tourists. *Procedia Economics and Finance*, Volume 4, pp. 201–212
- Hartono, M., Tan, K.C., Peacock, J.B., 2013. Applying Kansei Engineering, the Kano Model and QFD to Services. *International Journal of Services, Economics and Management*, Volume 5(3), pp. 256–274
- Hartono, M., 2014. Incorporating Customer Emotional Needs using Kansei Engineering and Kano Model to Support Customer Relationship Management: A Case Study in Healthcare Services. *In: Proceedings of Joint Asia Pacific Computer and Human Interaction and Ergofuture International Conference*, October 22-25, 2014, Bali, Indonesia
- Hartono, M., Raharjo, H., 2015. Exploring the Mediating Role of Affective and Cognitive Satisfaction on the Effect of Service Quality on Loyalty. *Total Quality Management & Business Excellence*, Volume 26(9-10), pp. 971–985
- Hartono, M., 2016a. The Extended Integrated Model of Kansei Engineering, Kano, and TRIZ Incorporating Cultural Differences into Services. *International Journal of Technology*, Volume 7(1), pp. 97–104
- Hartono, M., 2016b. A Conceptual Integrative Model of Kansei Engineering, Kano and TRIZ Towards Sustainability in Services. *In: Proceedings of 8<sup>th</sup> Widyatama International Seminar on Sustainability*, 5-8 September 2016, Bandung, Indonesia
- Helander, M.G., Khalid, H.M., 2006. Affective and Pleasurable Design. *In: Salvendy, G. (ed.), Handbook of Human Factors and Ergonomics*. 3<sup>rd</sup> edition, New York: Wiley Interscience, pp. 543–572
- Hsu, C.L., Lin, C.S., Chen, M.C., 2011. Exploring Logistics Services Quality in Home Delivery Industry: Do Service Providers and Customers Have Different Viewpoints? *Journal of Quality*, Volume 18(5), pp. 439–454
- Kano, N., Seraku, N., Takahashi, F., 1984. Attractive Quality and Must Be Quality. *Quality*, Volume 14(2), pp. 39–44
- Llinares, C., Page, A.F., 2011. Kano's Model in Kansei Engineering to Evaluate Subjective Real Estate Consumer Preferences. *International Journal of Industrial Ergonomics*, Volume 41, pp. 233–246
- Lovelock, C., 1991. *Services Marketing*. Prentice-Hall, Englewood Cliffs, NJ
- Nagamachi, M., 1995. Kansei Engineering: A New Ergonomic Consumer-oriented Technology for Product Development. *International Journal of Industrial Ergonomics*, Volume 15, pp. 3–11
- Nagamachi, M., Lokman, A.M., 2011. *Innovations of Kansei Engineering*. Boca Raton: CRC Press
- Nishino, T., Nagamachi, M., Ishihara, K., Ishihara, S., Ichitsubo, M., Komatsu, K., 1999. Internet Kansei Engineering System with Basic Kansei Database and Genetic Algorithm. *In: Proceedings of TQM and Human Factors (Linköping, Sweden: Centre for Studies of Humans, Technology and Organization)*, pp. 367–372
- Norman, D.A., 2004. *Emotional Design: Why Do We Love (or Hate) Everyday Things*. New York: Basic Books

- Parasuraman, A., Berry, L.L., Zeithaml, V.A., 1988. SERVQUAL: A Multiple-item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing*, Volume 64, pp. 12–40
- Rasamoelina, F., Bouchard, C., Aoussat, A., 2013. Towards a Kansei-based User Modeling Methodology for Eco-design. *International Journal of Affective Engineering*, Volume 12(2), pp. 337–348
- Schütte, S., 2005. Engineering Emotional Values in Product Design. Kansei Engineering in Development. *Thesis*. Linköping University, Linköping
- Stefano, N.M., Casarotto, F.N., Barichello, R., Sohn, A.P., 2015. A Fuzzy SERVQUAL Based Method for Evaluated of Service Quality in the Hotel Industry. *Procedia CIRP*, Volume 30, pp. 433–438
- Tan, K.C., Pawitra, A.T., 2001. Integrating SERVQUAL and Kano's Model into QFD for Service Excellent Development. *Managing Service Quality*, Volume 11, pp. 418–430
- Vargo, S.L., Lusch, R.F., 2004. The Four Service Marketing Myths-remnants of Goods-based Manufacturing Model. *Journal of Service Research*, Volume 6(4), pp. 324–335
- Wong, A., 2004. The Role of Emotional Satisfaction in Service Encounters. *Managing Service Quality*, Volume 14(5), pp. 365–376
- Yogasara, T., Valentino, J., 2017. Realizing the Indonesian National Car: The Design of the 4×2 Wheel Drive Passenger Car Exterior using the Kansei Engineering Type 1. *International Journal of Technology*, Volume 8(2), pp. 338–351



# International Journal of Technology

**COUNTRY**

Indonesia



Universities and research institutions in Indonesia

**SUBJECT AREA AND CATEGORY**

Business, Management and Accounting  
 Management of Technology and Innovation  
 Strategy and Management

Engineering  
 Engineering (miscellaneous)

**PUBLISHER**

Faculty of Engineering Universitas Indonesia



Faculty of Engineering Universitas Indonesia in Scimago Institutions Rankings

**H-INDEX****12****PUBLICATION TYPE**

Journals

**ISSN**

20869614

**COVERAGE**

2010-2020

**INFORMATION**[Homepage](#)[How to publish in this journal](#)[ale.berawi@gmail.com](mailto:ale.berawi@gmail.com)**SCOPE**

International Journal of Technology aims to provide cutting-edge research and practices in the management and design of technology, a forum for debate and reflection as well as an anchor point for many technology practitioners and academics programs. Submission are invited concerning any theoretical or practical treatment of technology design, development and application (from various field of study such as: architecture, chemical, civil, electrical, industrial, material, and mechanical engineering). The subject of papers contributed may cover, but is not limited to: Discussion and exploration of new theory and knowledge of technology, innovation and sustainable development. Industrial and service management, product and process design, and performance improvement. Proficiency in the understanding technology design, development and application derived from experimental data analysis. Case studies reporting insights and best practices regarding technology design and development drawn from practices. Technology tools, techniques and other structured approaches to understand, measure, or provide value. Empirical observations resulting in original and significant conclusions or application papers in the above areas are also welcome.

 Join the conversation about this journal

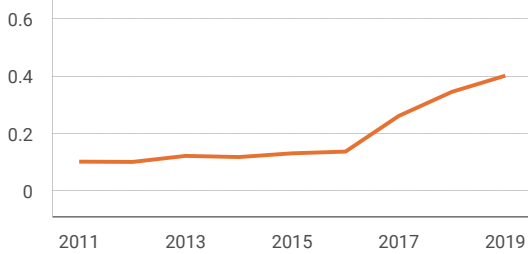




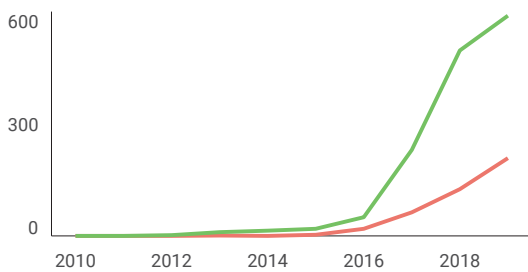
FIND SIMILAR JOURNALS ?

<p>1 <b>Environmental Progress and Sustainable Energy</b> USA</p> <p><b>17%</b> similarity</p>	<p>2 <b>Clean Technologies and Environmental Policy</b> DEU</p> <p><b>16%</b> similarity</p>	<p>3 <b>Renewable and Sustainable Energy Reviews</b> NLD</p> <p><b>15%</b> similarity</p>	<p>4 <b>Energy Sources, Recovery, Utiliza</b> GBR</p> <p><b>15%</b> similarity</p>
--	--	---	--

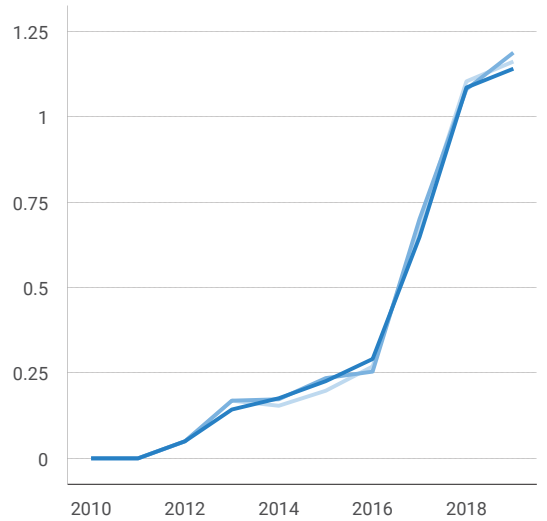
SJR



Total Cites    Self-Cites



Citations per document



- Cites / Doc. (4 years)
- Cites / Doc. (3 years)
- Cites / Doc. (2 years)

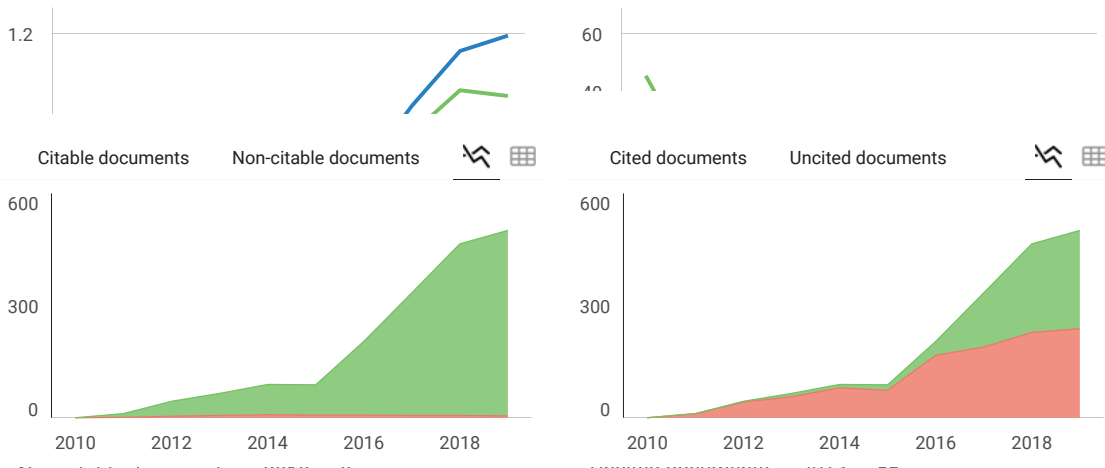
External Cites per Doc

Cites per Doc



% International Collaboration





**International Journal of Technology**

Q1 Engineering (miscellaneous) best quartile

SJR 2019 0.4

powered by scimagojr.com

← Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scimagojr.com" style="display: inline-block; border: 1px solid black; padding: 2px 5px;">https://www.scimagojr.com
```

Metrics based on Scopus® data as of April 2020

A **anju panwar** 3 months ago

I WANT TO PUBLISH A PAPER IN YOUR JOURNAL SO WHAT WILL BE THE CHARGES AND TIME DURATION.

reply

A **amanda serrano** 4 months ago

Buenos días, ¿donde puedo encontrar el indice de impacto/de calidad? gracias.

reply



**Melanie Ortiz** 3 months ago

Dear Amanda,

Thank you for contacting us. You can consult the SJR indicator just above.

SCImago Team

Best Regards, SCImago Team

B **Bahrani** 7 months ago

Dear  
Team Scimago

I would like to submit my article. the title article is the influence of service quality on student satisfaction of Teacher Training and Tarbiyah Faculty. it is the result of research in 2019. is it relevant to your journal. if yes, Could You please give the link of journal address?

Best Regard,

Bahrani (Author)

reply



**Melanie Ortiz** 7 months ago

SCImago Team

Dear Bahrani,  
thank you for contacting us.  
We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.  
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage (See submission/author guidelines) or contact the journal's editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team

J **jamal** 8 months ago

Dear

Is it ISI-Citation journal?

Thank you

reply



**Melanie Ortiz** 8 months ago

SCImago Team

Dear Jamal, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check out our web to localize the journal. We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

H **Hadi** 10 months ago

Is this journal recieved manuscrite in metrology field. Thanks a lot for a good attention.

reply



**Melanie Ortiz** 10 months ago

SCImago Team

Dear Hadi,

thank you for contacting us.

Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage (See scope and submission/author guidelines) or contact the journal's editorial staff , so they could inform you more deeply.

Best Regards, SCImago Team

A **ASMAT** 11 months ago

This journal totally disappointed me. I submitted my article in march 2019 in that time there were no APC charge, and entire 2019 year, the editor board did not reply regarding reviewing status. This journal has taking APC from jan 2020, and they send me email in feb 2020 for APC charge agreement.

I am poor studuent, how can I pay APC like 550 USD and my college was also not agreed to do this. This journal wasted total 1 year of my article.

reply

S **Sergio** 9 months ago

There are many journals free to publish



**Melanie Ortiz** 2 years ago

SCImago Team

Dear user,

thank you for contacting us.

Sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.

Unfortunately, we cannot help you with your request, we suggest you to go to the journal's

homepage or contact the journal's editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team

reply

Z **Zulkipli Jemain** 1 year ago

Melanie Ortiz, whom we respect.

I am a researcher in the field of education management. can Melanie help me? I really need a journal or book related to the title of my research, titled "Competitiveness of the Quality of Religious Education Institutions.

If this article has been read by a friend, and deigned to help. can send messages to email:  
zulkiplijemain@gmail.com



**Melanie Ortiz** 1 year ago

SCImago Team

Dear Zulkipli, thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you to use the Search Tool just above and enter key words to find a Journal according to your request. You can also select a Category and look for a journal within. Best Regards, SCImago Team

F **Fermi Dwi Wicaksono** 2 years ago

Dear IJTECH Editor (Dr. Nyoma Suwartha),

I have notified that my paper is accepted to be published in the International Journal of Technology on 14 September 2018, and the IJTECH has conducted line editing to my paper as part of the publication process.

Until now I have not obtained any notification about the paper acceptance when to be published, and please reply my email.

Kindly your information when will this paper be published on IJTECH?.

Regards,

reply

S **Secretariat IJtech** 2 years ago

Dear Mr. Fermi Dwi Wicaksono,

Thank you for your message. Due to the long queue of the papers that have been accepted and the limited slots available for each issue,



it may take many months for the accepted papers to go into the publication.  
At the moment we cannot yet inform you in which issue your paper will be published, but please be assured that all papers will go through the standard procedure of article processing.

Thank you for your contribution to IJTech.

--

Kind regards,  
Secretariat IJTech  
International Journal of Technology (IJTech)  
ISSN : 2086-9614  
<http://www.ijtech.eng.ui.ac.id>

A **AGUS KUSNAYAT** 3 years ago

when is the receipt of the paper again and what are the conditions to be accepted.

reply



**Fathul Arifin** 2 years ago

it is free.

You will be ask for line editing, after your article is accepted. It is about US\$130 for line editing. if you ask them to do that.



**Elena Corera** 3 years ago

SCImago Team

Dear Agus Kusnayat,

thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you contact journal's editorial staff so they could inform you more deeply. You can find contact information in SJR website <https://www.scimagojr.com>

Best regards,  
SCImago Team

R **raheel** 3 years ago

fee for publication ?

reply



**Elena Corera** 3 years ago

SCImago Team

Dear Raheel,

thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you check author's instructions in journal website. You can find that information in SJR website <https://www.scimagojr.com>

Best Regards,  
SCImago Team

D **Dileep** 3 years ago

Is this journal paid??  
How much publication charge??

reply

D **Dileep** 3 years ago

Is this journal is paid??  
If yes how much is charge per paper??

reply



**Elena Corera** 3 years ago

SCImago Team

Dear Dileep, we suggest you contact the journal directly. Best Regards, SCImago Team

J **junaidi Husin** 3 years ago

My Name is Junaidi,I wont published articele if myt articele is the best wint revier

YOUR'S SINCERELLY  
JUNAIDI

reply



**Elena Corera** 3 years ago

SCImago Team

Dear Junaidi, in the link below you will find the information corresponding to the author's instructions of this journal. Best regards, SCImago Team  
<http://www.ijtech.eng.ui.ac.id/old/index.php/journal/about/submissions>

**Leave a comment**

Name

Email

(will not be published)

 I'm not a robot reCAPTCHA  
Privacy · Terms

Submit

The users of Scimago Journal & Country Rank have the possibility to dialogue through comments linked to a specific journal. The purpose is to have a forum in which general doubts about the processes of publication in the journal, experiences and other issues derived from the publication of papers are resolved. For topics on particular articles, maintain the dialogue through the usual channels with your editor.

---

Developed by:



Powered by:



Follow us on @ScimagoJR

Scimago Lab, Copyright 2007-2020. Data Source: Scopus®

**EST MODUS IN REBUS**  
Horatio (Satire 1, 1, 106)

---