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The 2nd International Conference on
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IESS 2013



Challenges and Opportunities of Service Industry in Emerging Economies

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Invited Speakers

Amrik Sohal

Professor, Monash University, Australia



Amrik S. Sohal is a Professor in the Department of Management at Monash University, Australia. He has authored or co-authored over 150 papers published in refereed journals, as well as three books and a number of chapters contributed to books. His current research interests are in operations strategy, technology management, quality/innovation management and supply chain management. Professor Sohal is a member of the Editorial Board of a number of journals in the area of quality management, technology management and operations management. Professor Sohal has received research grants from the State and Federal Governments, the Australian Research Council, local industry and Monash University. In 2001, Professor Sohal received the Vice-Chancellor's Award for Postgraduate Supervision. In 2004, he received an award for research excellence from the International Association for Management of Technology and in 2009 the

publications award from the same organisation. In 2010, Professor Sohal received the Dean's Award for Excellence in Research.

Rajesh Piplani

Associate Professor, The school of Mechanical and Aerospace Engineering, Systems and Engineering Management Nanyang Technological University, Singapore



Dr. Rajesh Piplani is the director of the Center for Supply Chain Management at NTU. He obtained his M.S. in Industrial Engineering from Arizona State University in 1990, and his Ph. D. from Purdue University in 1995. Dr. Piplani is listed in Marquis Who is Who in Science and Engineering in USA (1998-1999). He has over seven years of industry experience in India and USA in the areas of Supply-chain management and production planning of power plant equipment and semiconductor fabrication facilities. Since 1998, he has been on the faculty of NTU. He is Program Manager, Integrated Manufacturing and Service Systems (IMSS) for Singapore funding agency A*Star, managing the SGD 8 Million program. He is an associate consultant with Y3 Technologies. He also sits on the eSCM council of Singapore Manufacturers Association and council of Supply Management Institute of Germany.

PREFACE

The 2nd International Conference on Industrial Engineering and Service Science (IESS - 2013) was organized by Industrial Engineering Department of Institut Teknologi Sepuluh Nopember (ITS) in collaboration with Department of Decision and Information Sciences at the Charlton College of Business, University of Massachusetts Dartmouth (USA) and Industrial Engineering Department of Gunadarma University, Indonesia. IESS is a cross disciplinary conference that brings together leading scholars, researchers, teachers and practitioners examining the blend of Industrial engineering discipline and service science and their impact in today's business practices.

This conference was convened following the previous conference under the same title held in Solo, Central Java at 2011. This year conference theme's is **“Challenges and opportunities of service industry in Emerging Economies”**.

In this conference we have received more than 115 submissions. After thorough peer review process, we have selected seventy three papers to be presented. This process was performed in order to assure the quality of the papers in presentation sessions. We thanks to all reviewers who have spent hours reviewing all the assigned submission and ensuring the quality of the papers.

Finally we would like to express our sincere thanks to those who have paid a great deal of effort and time for preparing and organizing the IESS 2013, and to take this opportunity to express our sincere appreciation to all the presenters, delegates, reviewers, keynote speakers for their interesting and valued contributions. Our special thanks also go to our Silver Sponsor, PT Telkomsel Indonesia for providing generous support for this conference.

August 20th 2013

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The integrative framework of Kansei Engineering and SERVQUAL incorporating CRM applied to services: A case study on hotel services in Surabaya

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ABSTRACT

Understanding customer needs better is a key for the success of customer relationship management (CRM). It may cover insight into customer decision-making and information about customers. Essentially, CRM is to understand customer needs so that it may improve a company's long-term profitability. Lack of customer focus is quite critical to the success of CRM implementation. Specifically, a mechanism for maintaining and developing customer loyalty is a key potential to be taken into account. In short, understanding of customer needs (both functional and emotional) is needed. More importantly, understanding customer emotional needs is vital for predicting and influencing customer purchasing behavior. Customers today concern themselves more on satisfying their emotions and feelings more on satisfying their emotions than merely their cognition. Some commonly used service quality tools such as quality function deployment (QFD) and SERVQUAL have been applied extensively to services. Many service researchers have successfully used SERVQUAL and other similar scales to measure and improve service quality in a variety of industries. But none have been able to incorporate customers' emotional needs. Some attention has been given to investigate this. But thus far, there is no formal methodology that can account for customer's feelings and emotions taking into account CRM in service design. To fill this niche, this study proposes an integrative framework of Kansei Engineering (KE) and SERVQUAL applied to services. This study uses data from tourists who stayed in hotels in Surabaya to demonstrate the integrative model framework and show how the customer emotional needs can be designed into its hotel services system.

Keywords: *Kansei Engineering, SERVQUAL, customer relationship management, CRM, customer emotional needs*

1. Introduction

In today's fast changing and globally competitive world, it is imperative for companies to provide competitive and differentiated products and services. Competitive pricing, performance and features have become relevant factors in deciding which products to buy [3]. Products and services, therefore, need to offer features and properties which can make them distinguishable, unique and attractive to customers. Market dynamics and technological uncertainty play significant role to influence company's internal resources (e.g., equipment/facilities, tools/methods and systems) to produce company's outputs. These factors can potentially affect company's capabilities because they bring new scientific knowledge that enhances the intensity of global competition, economy of scale and scope, and also customer preferences and demands [4]. Thus, to cope with this issue, a company should react promptly through appropriate strategy and formulate long-term strategic marketing orientation [5]. Surely, customer focus is a must.

There is little or no formal guidance for managers or service providers on how to design and implement customer satisfaction systems successfully [6]. As a result, thus, many customer satisfaction systems initiatives fail to reach their potential in terms of providing the hoped-for benefits of increased customer satisfaction [6].

In understanding and measuring the service quality for satisfying customers, several service quality models were proposed. Gronroos [6] developed a two-dimensional model that included technical quality (what the customer receives) and functional quality (how the service is received). In addition, within the service industry, SERVQUAL was introduced (see [8]). This model has been the most widely accepted and used instrument to measure the service quality of an organization. It has been, hence, subjected more criticism. One of common critics is about the uniform

applicability of the measure to many service sectors which may be potentially creating problems with validity and reliability [9].

It is profitable if firms or companies can retain existing customers. Essentially, it is not only to achieve customer satisfaction, but also how to obtain customer retention. According to Stringfellow *et al.* [1], a lack of customer focus is quite critical to the success of CRM implementation. Moreover, understanding customer emotional needs is vital for predicting and influencing customer purchasing behavior [2]. Many CRM databases only record information on customer demographics and transaction numbers without revealing about people. The reasons of why many companies fail to capture crucial customer needs while implementing CRM have been addressed by Stringfellow *et al.* [1]. They include lack of awareness of the importance of knowing customer needs during transaction process, the difficulty of how to collect and interpret customer needs, and the failure of translate intuitive or ambiguous information about customers.

Nowadays, the focus by customers has shifted from objects to product/service experiences. This refers to the switch from functionalism to product semantics [10]. This is deemed to be the new battleground [11]. The impression of product experience brings customer satisfaction (see [12], [13] and [3]). Norman [14] argues that customers are happy because the products and services that they use are easy to deal with and more harmonious results are produced. This fact is supported, for example, by evidence of the very successful sale of Apple products that incorporated emotional design. More than 150 million iPods have been sold worldwide since September 2007 [15]. With regard to the lack of customer focus on emotional needs during CRM implementation and the needs for achieving service excellence measurement using SERVQUAL model, an initiative to incorporate integrative systems model is needed. One of the most appropriate approaches is Kansei Engineering (KE) [16]. The works using KE application in services have been done and proposed by several scholars (see [5] and [17]). It is, however, KE application in services incorporating customer focus and retention is relatively unexplored. This current study, hence, is to propose an integrative framework of KE and SERVQUAL model in services incorporating CRM.

This paper is organized as follows. After the introduction, it will be followed by research objective and a brief literature review on Kansei Engineering in particular, SERVQUAL and CRM concepts. Afterwards, integrative framework development, research methodology and empirical study on hotel services in Surabaya are discussed. Then, it will be wrapped up by providing discussion session and followed by conclusion and further research recommendation.

2. Objective

This study provides two main objectives. First, with respect to customer emotional needs and CRM-oriented, it is to propose an integrative framework of SERVQUAL and Kansei Engineering incorporating CRM concept applied to services. Second, to give a practical implementation of the proposed integrative framework, a case study on hotel services in Surabaya is provided. It is hoped that by promoting this integrative framework followed by an empirical study will provide practical guidance to service providers in closing the gap between perceived and expected service quality. In addition, the expected results will provide service managers an input as the prioritization tool for service improvements.

3. Literature review

3.1. Services and human factors

A product or service should be designed beyond functionalism and, surely, it comes out as “from the inside out.” Form should follow function. The opportunities to improve measurements of customer perceptions of quality by combining and integrating existing concepts have been realized (see [5], [6] and [17]).

Essentially, services reveal an interaction between two parties. It is a human-oriented activity where humans play the roles of provider and customer. The centrality of human in both human factors/ergonomics and service science forms the basic link to further explore the possible area of intersection between them. Inherently, human factors/Ergonomics has a concern with human well-being applied to both the customer and the employee. In terms of the scope of service industries, human factors and service quality need to exploit their similarities rather than dwell on their differences to ensure satisfying employment [18].

When customers evaluate services, they tend to focus on both appearance and external impression. Consumers are more likely to judge and evaluate tangible aspects, such as external appearances and physical surroundings. Actually, the service evaluation is not only involving physical appearances and surroundings, but also the overall quality of services.

3.2. Service quality model

The quality of products and services is measured by the degree to which the products and services meet the customer expectations and needs. Service quality is positively related to customer emotional satisfaction in many research works [19].

According to Kotler *et al.* [20], service quality comprises two main aspects, i.e., technical quality and functional quality. Technical quality refers to tangible aspects and physical appearances of the services (servicescape). It is what is delivered to the customers and what the essential features the customers receive after the customer-employee interactions have been produced. Physical surroundings may unconsciously affect people emotion, cognition and behavior. Exterior facilities, general interior, store layout, interior displays and social dimensions in a retail store show the examples of technical quality of services [21]. Functional quality refers to intangible aspects of services. It focuses on the interaction between customers and employees during service encounters (see [20] and [22]).

Parasuraman *et al.* [8] introduce a service quality model (known as SERVQUAL) for measuring and exploring overall customer experiences. This model consists of five dimensions, i.e., tangible, responsiveness, reliability, assurance and empathy. This SERVQUAL model is quite popular among services researchers, and it's quite a few that the model has many critics and modifications. Its application may have been integrated to other service quality tools and different service contexts [5].

3.3. Kansei Engineering

Kansei Engineering (KE) has been introduced and utilized since 1970s. It has been defined as an ergonomic technology with a focus on customer-oriented product development taking into account the customer emotional needs and feelings [16]. This powerful emotions-oriented approach is able to deal with both attractive exterior appearances and properties which are not directly detectable or visible such as the atmosphere of a concert hall, the concepts of good driver feeling or quality feeling by modifying the engineering properties of the products ([5] and [23]). Mazda Miata is one example of the KE's pinnacles of success.

Comparing to other similar methods and research methodologies, KE is deemed to be superior ([5], [17] and [24]). KE can formulate a mathematical model of Kansei responses through all the human senses and external stimuli with a set form of service attributes or product elements. Taking into recent development of integrated tools and methods, KE is capable of integrating its methodology with other service or product quality tools. Most relevant and common tool is Quality Function Deployment and Kano model (see [5]). In addition, KE utilizes statistical engineering in the use of service tools [25]. More importantly, in short, KE has a strong ability to grasp and accommodate 21st century trends such as hedonistic, pleasure and individualistic [13]. This is where customers tend to expect and put their attention more on emotional impressions rather than merely on technical quality and usability [16].

3.3. Customer relationship management

Basically, CRM basic model consists of seven core elements [26], such as: a database of customer loyalty, analyses of the database, decisions about which customers to target, tools for targeting the customers, how to build relationships with the targeted customers, privacy issues, and metrics for measuring the success of the CRM program. The focus of this study is on relationship program. It is more of a technique for implementing CRM. The overall goal is to deliver a high level of customer satisfaction and delight. This relationship program consists of several items such as customer service, frequency/loyalty programs, customization, community building, and rewards programs. Since customer satisfaction and delight deal with customer emotional needs, KE is potential to use in linking those emotional needs with particular CRM service items.

4. Integrative framework development, research methodology and empirical study

An initiative the use of service quality tools that allow service designers/providers and managers to design a truly customer-centric service system reflecting and incorporating actual customers' emotional responses (Kansei) to a service has been conducted. It, however, still relatively opens some adjustments and modifications due to cultural issues and service contexts [5]. Essentially, this approach goes beyond customer needs on high technical quality of service attributes that may be so easily duplicated and imitated today. To understand the relationship between KE, SERVQUAL

model and CRM, this study proposes an integrative application model framework followed by research methodology and empirical study. This current study uses case study and survey. This type of research strategy is found to be the most powerful research method in the exploration phase and theory building, testing and extension [27]. Personal interviewing and face-to-face questionnaire were utilized to collect data. The face-to-face questionnaire will allow clarification on complex and ambiguous questions, problem verification and spontaneity of participant. The effectiveness of use of this method has been shown in the previous studies (see [5], [17] and [24]).

A case study on hotel services in Surabaya was conducted. There were 102 respondents involved (51 females and 51 males) with the age range of 21 – 40 years old. The distribution of hotel services was 3-star (33.33%), 4-star (33.33%) and 5-star (33.33%). A unified questionnaire that consists of 3 different survey questions (SERVQUAL, Kansei and CRM) was used and distributed. All variables were deemed valid and reliable after passing through validity and reliability tests using confirmatory factor analysis (CFA) of Structural Equation Modeling (SEM) by AMOS™ version 16. This technique is utilized to verify the factor structure of a set of observed measures and to test the hypothesis that a relationship between observed variables and their principal latent constructs exists [28]. The proposed relationships among constructs during service encounters followed by hypothesis testing are provided as follows.

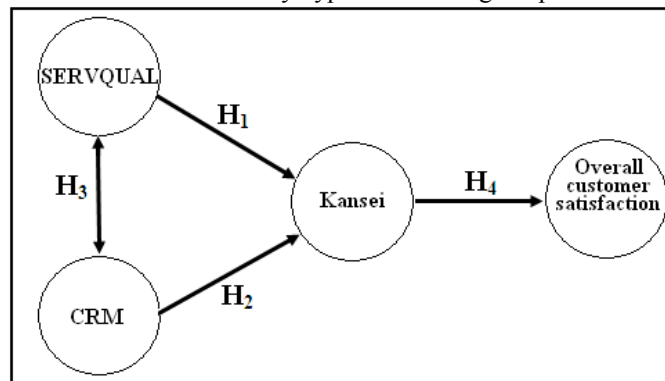


Figure 1. General framework of SERVQUAL, KE and CRM in services

The CFA revealed an adequate fit of the model to the current data based only on the root mean square error of approximation (RMSEA) (0.075 with a cutoff value of ≤ 0.08) and closed to an adequate fit based on the minimum discrepancy and degree of freedom (CMIN/df) (1.566 with a cutoff value of ≤ 2.00). All statistical tests were assessed, as the following demonstrates:

Table 1. Hypothesis testing of constructs using regression weight (SEM output)

Hypothesis	P*	Standardized	Remarks
H1: SERVQUAL → Kansei	0.880	-0.038	The perception of service experience (SERVQUAL) was not significantly related to emotional response (Kansei). Mostly all service attributes were rated according to the customers' expectation and perception, and not directly influence their emotions [30].
H2: CRM → Kansei	0.006**	0.701	The result shows that there was a significant effect of CRM on Kansei. Good CRM and how to satisfy customers will produce positive emotions [29].
H3: SERVQUAL ↔ CRM	0**	0.856	There was a positive correlation between SERVQUAL and CRM. Both CRM and SERVQUAL aim to improve service quality and maintain good longterm relationship with customer.
H4: Kansei → Overall customer satisfaction	0.002**	1	The result shows that positive emotional experience (Kansei) produced overall customer satisfaction [5]. Dominant Kansei experienced were happy, peaceful and passionate for hotel services according to this study.

*significant value; ** significant at $\alpha = 0.05$

5. Discussion

According to the backbone of research topic on Kansei Engineering, this study was conducted to assess the emotional responses of customers who stayed at least 2 days either in the 3, 4, 5-star hotels in Surabaya. Based on result shown in Table 2, in general, the Kansei “relaxed” was expected to be the most important impression. Among all Kansei, however, more efforts should be taken into consideration for several critical Kansei since they had the most negative gap, such

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as “relaxed” (3-star), “peaceful” (4-star) and “relieved” (5-star). In addition, especially for 3-star hotel, “relaxed” was deemed to be of highest critical emotional need since it had the highest expectation value with the highest gap value.

Table 2. Mean values and gaps of Kansei words among all hotel types

Kansei word*	3-star hotel			4-star hotel			5-star hotel		
	E	P	Gap	E	P	Gap	E	P	Gap
Welcome	4,18	4,18	0	4,32	4,03	- 0,29	4,26	4,00	- 0,26
Happy	4,12	4,12	0	4,50	4,00	- 0,50	4,41	4,21	- 0,20
Confident	3,62	3,94	+0,32	4,00	3,88	- 0,12	4,18	4,09	- 0,09
Relaxed	4,47	4,24	- 0,23	4,59	4,15	- 0,44	4,56	4,32	- 0,24
Peaceful	4,24	4,06	- 0,18	4,59	3,79	- 0,80	4,41	4,18	- 0,23
Satisfied	4,18	4,21	+ 0,03	4,09	4,03	- 0,06	4,26	4,03	- 0,23
Elegant	3,68	3,56	- 0,12	3,88	3,97	+ 0,09	4,21	4,15	- 0,06
Friendly	4,26	4,06	- 0,20	4,44	4,15	- 0,29	4,44	4,32	- 0,12
Relieved	3,85	3,71	- 0,14	4,29	3,94	- 0,35	4,21	3,91	- 0,30
Passionate	3,76	3,62	- 0,14	3,82	3,50	- 0,32	3,97	3,74	- 0,23
Quiet	4,06	4,00	- 0,06	4,09	3,85	- 0,24	4,09	3,97	- 0,12
GRAND MEAN**	4,04	4,09	+ 0,05	4,25	3,95	- 0,30	4,29	4,13	- 0,16

*E = Expectation; P = Perception; Gap = P – E; **All values were deemed important since they are above point 3 (average)

Using the SEM output by AMOSTM (see Table 3), the selected Kansei words and SERVQUAL attributes and CRM variables were then met and linked together. With regard to the emotional response (Kansei), related to SERVQUAL, there were two critical service attributes, i.e., hotel atmosphere and facilities. Apart from that, the critical variable of CRM was determined as well, it was for customer benefits (benefits offered to potential and actual customers).

Table 3. Significant model of Kansei related to SERVQUAL and CRM for service improvement initiatives

Kansei word	SERVQUAL attributes	CRM	
		Dimension	Variable
Welcome	Hotel atmosphere; general services	Customer satisfaction	Convenience
		Relationship level	Personal attention
Happy	Hotel interior*; cleanliness	Customer satisfaction	Ease of communication with customer
		Relationship level	Benefits offered**
Confident	Physical surroundings; reputation; pricing; facilities*	Customer satisfaction	Benefits offered
		Relationship level	Customer value
Relaxed	Hotel atmosphere; facility and entertainment	Customer satisfaction	Ease of how to access hotel information
		Relationship level	Benefits offered
Peaceful	Temperature; interior design; facilities; meals	Customer satisfaction	Services offered
		Relationship level	Ease of communication with customer
Satisfied	Cleanliness; floor; entertainment; facilities; prompt response	Customer satisfaction	Benefits offered
		Relationship level	Services offered
Elegant	Colors; interior design; floor; facilities	Customer satisfaction	Prompt response due to customer complaint
		Relationship level	Prompt and correct problem solving
Friendly	General services	Customer satisfaction	Benefits offered
		Relationship level	Services offered
Relieved	Room interior and atmosphere; colors	Customer satisfaction	Personal attention
		Relationship level	Ease of communication with customer
Passionate	Interior design; colors; musics	Customer satisfaction	Benefits offered
		Relationship level	Frequent customer gathering
Quiet	Noise; musics	Customer satisfaction	Services offered
		Relationship level	Benefits offered

*the most critical variable of SERVQUAL attributes; **the most critical variable of CRM

6. Conclusion and further research

An integrative framework of SERVQUAL, KE and CRM has been tested through an empirical study on hotel services. The result shows that perceived service attributes related to CRM brought impact to Kansei, and eventually it influenced overall satisfaction. As for practical contribution, this study helps service managers identifying service attributes to be improved with respect to customer’s Kansei and CRM point of view.

Future research recommendation can be as follows. First, the applicability of the proposed integrative framework can be expanded by taking a case study on other types of service industries. Second, it is suggested to apply the same research methodology to other types of hotel services for developing a model for customer-oriented hospitality structures. With regard to more grounded managerial application, a quality tool such as Quality Function Deployment (QFD) can be utilized and integrated into the application framework.

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