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QUALITY FUNCTION DEPLOYMENT AND SERVQUAL BASED SERVICE QUALITY ANALYSIS: COMMERCIAL CLEANING COMPANY CASE IN JAKARTA, INDONESIA

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ABSTRACT
Customer satisfaction is reached when customer expectations regarding a service are met or exceeded. Customer requirements must first be identified and then translated into services needed by customers. Quality function deployment (QFD) is one of the product development techniques that translates customer requirements into activities for the development of products and services. This research investigates service quality of a commercial cleaning company in Jakarta by assessing customer requirements using 5 dimensions of SERVQUAL – tangibility, reliability, responsiveness, assurance and empathy. In-house quality is analyzed using QFD method. Interviews and customer surveys were conducted using 100 respondents from the customer and 69 respondents from its competitors. The result shows that optimum performance, flexibility of performance, and punctuality of performance are the most important customer requirements to focus on. Technical requirements with the highest priority for the service quality improvement are recruitment, SOP, and soft skill training.

INTRODUCTION
Service is a customizable industry that is very flexible and operates in almost all sectors. It is interrelated and integrated into all economic activities, public institutions, civil society organizations and individual lives (European Comission, 2013). In recent decades, service has become one of the important economic sectors worldwide (Cho, Lee, Ahn, & Hwang, 2012). To face that, management of service productivity requires consideration of both efficiency (productivity) and effectiveness (service quality and customer satisfaction) (Rust & Huang, 2012). According to Dominici & Palumbo (2013) the real aim of every business is not to supply,

not to sell, or not to serve, but rather to satisfy the needs that drive customer satisfaction.

A research involving 12 Asian countries (Hong Kong; China; India; Indonesia; the Republic of Korea; Malaysia; Pakistan; the Philippines; Singapore; Taipei; Thailand, and Vietnam) revealed that service sector does contribute to the region's growth, with productivity growth of services industries is pivotal for Asia's future growth (Park & Shin, 2012). Yet in Indonesia, the service sector is still underestimated based on the 2016 statement from Mari Elka Pangestu, the former Indonesian Minister of Tourism and Creative Economy (Ika, 2016). Over the past ten years, the service sector has grown by around 7%, higher than other sectors in Indonesia (Manning & Aswicahyono, 2012) which shows a large opportunity for Indonesia in the service sector. In order to reach the success in both the manufacturing and service industries, market-focus is key for success in business and designing for customer experience (Hartono, 2012). The market-focus or customer-focus will lead to improvement of customer satisfaction and sales volume growth (Birasnav, 2013). Besides, to reach customer satisfaction, service quality should be improved as it is antecedent to the customer loyalty according to existing research (Shi, Prentice & He, 2014). Pamies (2012) proved in his research that service quality is an excellent predictor of customer satisfaction, hence, service quality is an important indicator to be used to increase customer satisfaction. Service quality is said to be one of the crucial elements in the services business (Bakti & Sumaedi, 2012).

Researchers have developed several conceptual models for measuring service quality that enable management to identify quality problems and thus help in planning for the launch of a quality improvement programs, thereby improving the efficiency, profitability and overall performance (Baker, 2013). One of the indicators that has been used in many industries to measure the service quality delivered to their customer is cleanliness. Cleanliness has been identified as a critical criterion in judging the service quality (Zemke, Neal, Shoemaker, & Kirsch, 2014). Therefore, many industries took the opportunity to increase their service quality by providing cleanliness for their customers as an added value of their product and service, especially in the form of the commercial cleaning industry. In delivering a good quality of service in commercial cleaning industry there is a need to state the cleaning standard in the industry as has been stated by Stan Atkins, Group Chief Executive Officer of the British Institute of Cleaning Science (BICSc) (Atkin, 2014). In Indonesia this standard is developed by APKLINDO (Assosiasi Perusahaan Klining Servis Indonesia).

Recent trend in Indonesia's commercial cleaning Industry starting to grow rapidly is "online" maid service. In Indonesia, profession as a maid is common, with most of the middle-class to upper class hiring at least one maid, either live-in or providing daily service. This research explains customer expectations and the service quality performance in the commercial cleaning industry.

LITERATURE REVIEW

With the increasing globalization of the world economy, efficient operation is one of the ways to survive competition (Sukwadi, Wee, & Yang, 2013). Quality Function Deployment (QFD) is a customer-oriented approach to product innovation and was first initiated in Japan in 1960 by Professors Shigeru Mizuno and Yoji Akao (Shiravastava & Verma, 2014). QFD is a structured method for listening to the customer requirements/needs and transforming them into technical requirements to reach optimized material design and processes to ensure customer expectations are met (Park, Ham, & Lee, 2012; Qureshi, Khan, Bhatti, Khan, & Zaman, 2012). QFD methodology can be used for both tangible and intangible product such as manufacture goods, service industry, business process development, etc. (Büyüközkan & Çifçi, 2012). Furthermore, QFD is not only used in the development of new services but can also be used for the improvement of an existing service, which is the main area of application in this paper (Jaiswal, 2012). The successful QFD application may result in greater customer focus, shorter lead times, and knowledge preservation (Hsing & Chin, 2013). According to research by Chan and Wu, its use was identified in 22 countries worldwide in sectors such as telecommunications, transport, services electronics and construction sector (John, Smith, Chotipanich, & Pitt, 2014). The successful QFD application may result in greater customer focus, shorter lead times, and knowledge preservation according to Liu on (Liao & Kao, 2013).

The house of quality (HOQ) matrix is the fundamental structure of QFD. The HOQ matrix contains six major components (Prasad & Chakraborty, 2012; Wu & Lin, 2012). The Absolute Weights and Relative weights are used to help analyze specifically the importance of each quality component and how much effort it is needed for improvements (Prasad & Chakraborty, 2012).

Service Quality is a concept that has a close relationship with Customer Satisfaction (Zhao, Lu, Zhang, & Chau, 2012) defining service quality as the consumer's' overall impression of the relative inferiority/superiority of the organization and its services. One of the most popular literature discussing this are Parasuraman et al and GrÖnroos (Orel & Kara, 2013). They understand the service quality concept as the difference between customer expectations of a service to be received, and perceptions of the actual service received. The difference between importance and perceived satisfaction is called SERVQUAL gap score (Barabino, Deiana, & Tilocca, 2012). In this modern competitive environment, overall service quality is often used to evaluate customer's satisfaction (Rahman, Khan, & Haque, 2012). The service quality is critically determined by the difference between customers' expectations and their perceptions of the service actually delivered (Parasuraman, Zeithaml, & Berry, 1985). Parasuraman et al (1985) stated that five functional quality dimensions (SERVQUAL) which measure service quality - tangibility, reliability, responsiveness, assurance, empathy (Yousapronpaiboon, 2014). The gap between customer expectations and perceptions are defined as perceived service quality (Parasuraman et al., 1985). The gap (Q) is calculated by subtracting the expectation (E) from the perception (P) value i.e. P-E = Q (Adil, Al Ghaswyneh, & Albkour, 2013). A positive gap score indicates that expectations have been met or are exceeded while a negative gap score

indicates a failure (Purcarea, Gheorghea, & Petrescu, 2013). The common model used to measure service quality is SERVQUAL model proposed by Parasuraman *et al.* in 1988 (Amin, Yahya, Ismayatim, Nasharuddin, & Kassim, 2013). SERVQUAL model construct service quality with 5 dimensions which are reliability, responsiveness, assurance, empathy and tangibles. These five dimensions are then is used to build 22 instruments in SERVQUAL. The model allows us to see the gap between customer expectations and what they have received. This helps us to see the qualitative difference between what is being observed and an ideal service in the customer eyes (Barabino, Deiana, & Tilocca, 2012).

Customer satisfaction is an overall evaluation by the customers about the products and services, company and other related services offered by a firm (Saeed, Zehou, Hussain, & Haq, 2014). Customer satisfaction is meeting the customer expectations according Anders, Michael & Inger Roos (Saeed at al., 2014). Customer satisfaction involves behavior of customers that typically relate to purchase or consumption of product or services (Singh & Pattanayak, 2014). Past research has found significant correlation of customer satisfaction to positive outcomes including increased shareholder value, greater cash flows, and excess stock returns (Luo, Wieseke, & Homburg, 2012). Satisfied customers are more loyal and less sensitive to price movements (Singh & Pattanayak, 2014).

According to Bowman & Cole (2014), commercial cleaning industry exists because of the big gap in economic inequality where one group accepts the cleaning work from another wanting to avoid it. Kvist and Peterson on Bowman & Cole (2014) also state that with privileged women bestowing the domestic work to other groups, which a subordinate class of women carrying this work out is perpetuated. This leads to further grouping of classes that can cause the domestic work more vulnerable to abuse (Bowman & Cole, 2014).

MATERIALS AND METHODS

This research defines the customer needs/wants in the cleaning service and the level of satisfaction compared to company competitor in order to help the company increase service quality. The type of this research is applied business research as the purpose of our research is to solve the problem of the service quality (Sekaran & Bougie, 2016). The data is collected via surveys and then analyzed using the quality function deployment method. In quality function deployment method, a house of quality is developed as a tool demonstrating customer priorities of wants/needs from the company, how satisfied customers are with the company compared to its competitors, and much more. Data was obtained from 120 participants and the total number of valid questionnaire is 100. The total of distributed questionnaires is around 1000, questionnaire received are 74 and the total valid questionnaire are 69.

In building the house of quality, technical requirements needed to fulfill customer needs or wants must be revealed to show whether the company is performing well. An interview is conducted with the training division to get better understanding about what company does in the first place to serve the customer wants/needs.

RESULTS AND DISCUSSIONS

From the data obtained, 84% of 100 respondents are women. 35% of respondent are 17-30 years old, 49% are 30-50 years old, 7% respondent are above 60 years old, and 5% didn't indicate their age. From this data we can conclude that the majority of the respondents are adults in their productive age around 30-50 years old. 10% of the respondents have a Masters degree, 74% have bachelors degree and 7% have a diploma degree. Most of the respondents are working as a professional in private company, the second most common profession for the respondent is entrepreneurship, and the rest of the respondents work in other fields, are housewives, or are not working at the moment.

A relationship matrix is constructed of the scales that indicate the strength of the relation. The maximum or the strongest relationship is scale 9. The matrix shows relationship strength between VOC and technical requirements.

Table 1. *Relationship between VOC and Technical Requirement*

Technical Requirement / **Customer attributes**	**SOP**	**Soft-Skill Training**	**Hard Skill Training**	**Verified Identity of**	**Recruitment**	**Customer Application Notification**	**Maid Contact**	**Maid Application**	**Maid regular follow up**	**Customer service Contact**	**Customer Service**	**Customer Review**	**Integrated Bank Payment**	**Regular App update**
Neatness of uniform	9	9			9				1			3		
Application convenience					9	9	9			9		9	9	9
Availability of workers	9	9	9		9			9	9			1		
Neatness of performance	9	1	9		9				3			3		
Cleanliness of performance	9	1	9		9				3			3		
Order convenience					3	9				9	9			9
Payment convenience						9				9	9		9	
Scheduled order	9	9			9		9	9	9	9	9	9		
Responsive customer service	9	9	9	9	9					9	9	9		
Optimum performance	9	9	9		9	9	1	9	9			9		
Punctuality of workers	9	9	9		9		9	9	9		3	3		
Courtesy of workers	9	9			9				9			3		
Trustworthiness of workers	9	9		9	9				9			9		
Availability of requested workers						9				9	9			

Flexibility of performance	9	9	9	9	9	9	9	9

Source: Researcher, 2017

The improvement in each technical requirement affect customer satisfaction. There are 3 improvement direction of technical requirement.

Table 2. *Symbol of Improvement direction for Technical Requirement*

Symbol	Improvement
↑	Maximize
↓	Minimize
○	Meeting the target

Source: Researcher, 2017

- Maximize improvement means the satisfaction level of customer will increase in case the technical requirement is improved.
- Minimum improvement means the satisfaction level of customer will increase if the improvement of technical requirement decrease.
- Meeting the target means the satisfaction level of customer will increase if the technical requirement meeting a certain target.

Table 3. *Direction of Technical Requirement*

No.	Technical Requirements	Direction
1	SOP	↑
2	Soft-Skill Training	↑
3	Hard Skill Training	↑
4	Verified Identity of worker	O
5	Recruitment	↑
6	Customer Application	O
7	Maid Contact	↑
8	Maid Application	O
9	Maid regular follow up	↑
10	Customer service Contact	↑
11	Customer Service	↓
12	Customer Review	↓
13	Integrated Bank Payment	↑
14	Regular App update	↑

Source: Researcher, 2017

Correlation matrix is used to understand the relationship among technical requirements. There are 4 possible relationships

Table 0. *Symbol for Correlation among Technical Requirement*

No	Symbol	Correlation
1	++	Strong positive
2	+	Positive
3	-	Negative
4	0	No relationship

Source Researcher, 2017

Table 5. *Correlation among Technical Requirements*

Technical Attributes	SOP	Soft-Skill Training	Hard Skill Training	Verified Identity of worker	Recruitment	Customer Application Notification	Maid Contact	Maid Application Notification	Maid regular follow up	Customer service Contact	Customer Service Confirmation	Customer Review	Integrated Bank Payment	Regular App update
SOP		0	++	0	0	0	0	0	++	++	0	0	0	0
Soft-Skill Training	0		+	0	0	0	?	0	+	0	0	0	0	0
Hard Skill Training	++	+		0	0	0	0	+	+	0	0	++	0	0
Verified Identity of worker	0	0	0		++	0	0	0	0	0	0	++	0	0
Recruitment	0	0	0	++		0	0	s	0	0	0	+	0	0
Customer Application Notification	0	0	0	0	0		++	++	0	0	-	+	0	++
Maid Contact	0	?	0	0	0	++		0	+	0	-	+	0	0
Maid Application Notification	0	0	+	0	0	++	0		0	0	-	0	0	++
Maid regular follow up	++	+	+	0	0	0	+	0		0	0	++	0	0
Customer service Contact	++	0	0	0	0	0	0	0	0		0	++	0	0
Customer Service Confirmation	0	0	0	0	0	-	-	-	0	0		-	0	0
Customer Review	0	0	++	++	+	+	+	0	++	++	-		+	++
Integrated Bank Payment	0	0	0	0	0	0	0	0	0	0	0	+		+
Regular App update	0	0	0	0	0	++	0	++	0	0	0	++	+	

Source Researcher, 2017

A gap between satisfaction level and perceived importance level towards service quality is calculated to optimize the low quality of service and fulfill the customer wants and need. The formula to find gap score is

Gap Score = Satisfaction level - Importance Level

These are the gap score from customer and the competitors.

Table 6. *Customer Requirement Dimension and Gap Score*

Dimension	Attribute	Customer Perceived Score	Customer Importance Score	Gap Score
Tangibility	Neatness of uniform	4.09	3.23	0.86
	Application convenience	3.94	4.37	-0.43
Reliability	Availability of workers	3.97	4.51	-0.54
	Neatness of Performance	4.47	4.68	-0.21
	Cleanliness of performance	4.51	4.72	-0.21
	Order convenience	3.95	4.47	-0.52
	Payment convenience	4.14	4.52	-0.38
	Scheduled order	4.04	4.58	-0.54
Responsiveness	Responsive customer service	3.95	4.5	-0.55
	Optimum Performance	4.49	4.69	-0.2
Assurance	Punctuality of workers	4.52	4.58	-0.06
	Courtesy of workers	4.55	4.61	-0.06
	Trustworthiness of workers	4.58	4.81	-0.23
Empathy	Availability of requested workers	4.18	4.48	-0.3
	Flexibility of performance	4.49	4.62	-0.13

Source: Researcher, 2017

From the data above most of the attribute are reveal a gap between customer expectations and what they perceived. Regardless, most of the data are only slightly below the expected score with -0.06 as the smallest (worker punctuality and courtesy), and -0.55 as the largest (responsiveness of customer service). The only attribute above customer expectation is the neatness of the uniform when the maid coming to work.

Importance and Satisfaction Level

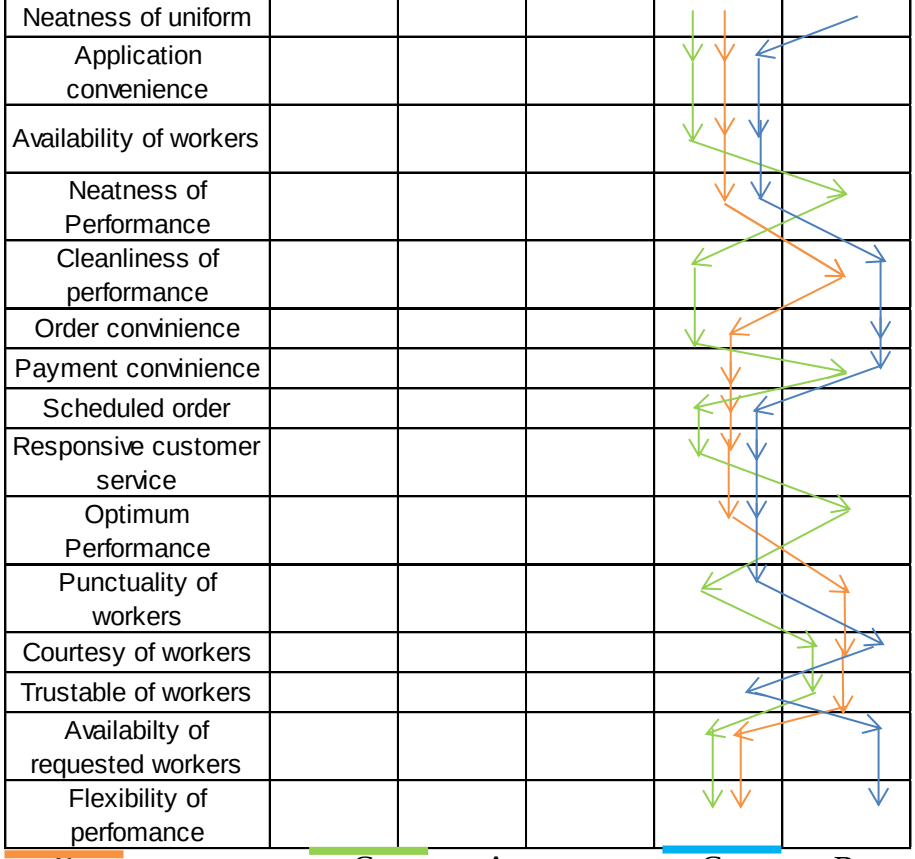
The level of importance in the eyes of the customers and the level of satisfaction are clearly defined by customer as customer attributes. The improvement decision fine-tune company focus on minimizing, maximizing or just meeting the target of each technical requirement. Not all attributes must be maximized but most do. Attributes that needed to be minimized are the attributes that when not performed well help other attributes.

Optimum performance is priority followed by flexibility of performance and punctuality of workers. Those are three dimensions that the company should pay attention to more as they bear the highest weight of requirement for the customer satisfaction. The least important customer requirement to focus on is order convenience, application convenience, and the neatness of

uniform. Those are the attributes that company can pay attention to less as the weight of the requirements are the lowest.

Table 7. *Customer Requirement Rank*

Customer Competitive Evaluation					
Customer attributes	**1**	**2**	**3**	**4**	**5**
Neatness of uniform					
Application convenience					
Availability of workers					
Neatness of Performance					
Cleanliness of performance					
Order convinience					
Payment convinience					
Scheduled order					
Responsive customer service					
Optimum Performance					
Punctuality of workers					
Courtesy of workers					
Trustable of workers					
Availabilty of requested workers					
Flexibility of perfomance					



Company : Company A: Company B:

Source: Researcher, 2017

Based on the data, the most important technical requirement is recruitment, followed by SOP, and soft skills training. These three requirements hold a critical position in giving better service quality for the customer. Recruiting of the right person for the job helps the company give customer better experience in using the service. The workers should be able to follow the rule and regulation of the company when performing their job. Besides that, attitude has become one of the man concerns of the customers, so soft-skill training plays an important role in improving the performance of the employees for the overall customer satisfaction. Those three technical requirements are not only high on the relative importance but also have high difficulty with score 8 for the difficulty. This means it is harder to establish the technical requirement to fulfill the customer needs/demand. Therefore requirement, standard operational procedure, and soft-skill training become the main importance technical requirement to be improved.

The least important technical requirements are Regular update, Integrated bank payment and Verified identity of worker. The three requirements have score 6 for the level of difficulty for establishment (which means quite difficult), but they have the lowest score for relative

importance. This is why all three are less important for quality improvement with the company better paying attention to the other technical requirements.

Table 8. *Technical Priority and Importance*

Technical Requirement	Relative Importance (RI) of Technical Feature	Difficulty	Final Importance
Recruitment	14.14%	8	1
SOP	12.64%	8	2
Soft-Skill Training	10.51%	8	3
Hard Skill Training	8.24%	8	4
Maid regular follow up	7.98%	6	5
Customer Review	7.84%	6	6
Customer service Contact	8.05%	2	7
Customer Service Confirmation	7.32%	8	8
Customer Application Notification	6.93%	4	9
Maid Application Notification	5.86%	4	10
Maid Contact	3.59%	6	11
Verified Identity of worker	2.38%	6	12
Integrated Bank Payment	2.27%	6	13
Regular App update	2.26%	6	14

Source: Researcher, 2017

CONCLUSIONS

There are 15 attributes of customer expectation/needs, and they are divided into 5 different SERVQUAL dimensions which are tangibility - neatness of uniform, application convenience; reliability - availability of workers, neatness of performance, cleanliness of performance, order convenience, payment convenience, scheduled order; responsiveness- responsive customer service, optimum performance; assurance- punctuality of workers, courtesy of workers, and trustworthiness of worker; empathy - availability of requested worker, and flexibility of performance. From the SERVQUAL gap score, the attribute of neatness of the worker uniform was the only attribute with a positive score, while the other attributes got negative score which mean the other 14 attributes still need more improvement to meet the customer expectation. The priority of the technical requirements is recruitment, followed by SOP, and soft skills training, where the three of them are also the most difficult technical requirements. The least important technical requirements are Regular update, Integrated bank payment and verified identity of a worker. The overall service performance is slightly behind its competitors. On some attributes, the performance is better than the competitors while the other attribute fall a bit behind the performance of its competitor.

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APPENDICES

Appendix A- House of Quality