

A QFD and SERVQUAL Approach to Hotel Service Design

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Abstract

Current challenges facing the hotel service providers, such as "high customer demands on quality", "increasing competition for high customer satisfaction" and "the demand for full services", are directly related to better understand the attributes of hotel services and improve the service design characteristics accordingly. In service quality literature, SERVQUAL is the most widely used structure to measure customer expectations and perceptions. Quality Function Deployment (QFD) method is also a suitable means and works well to support the development of a wide range of services although it is originally stemming from product development. This study describes the development of a conceptual framework to measure the hotel service quality using the SERVQUAL model as a starting point, and then identifies service design and hotel guests' requirements using a QFD approach. This integration of SERVQUAL and QFD approaches in the conceptual Hotel of Quality model has been illustrated through a case study.

Keywords: *Quality Function Deployment, SERVQUAL, Hotel Service Design, Hotel of Quality.*

OTEL HİZMETLERİNİN TASARIMINDA KFG VE SERVQUAL YAKLAŞIMLARININ KULLANIMI

Özet

Son zamanlarda otel hizmeti sunanların mücadele etmek durumunda kaldıkları, "müşterilerin istedikleri kalite seviyesinin yüksek olması", "daha fazla müşteri tatminini sağlamak için rekabetin artması" ve "eksiksiz hizmetin talep edilmesi" gibi konular doğrudan otel hizmetlerinin özelliklerini daha iyi anlamak ve bu özelliklere göre hizmet tasarım özelliklerini geliştirmek ile ilgilidir. Hizmet kalitesi alanında, SERVQUAL müşteri beklentilerini ve algılamalarını ölçmek için en çok kullanılan yapıdır. Kalite Fonksiyon Göçerimi (KFG) yöntemi ise, orijini ürün geliştirmeye dayanmasına rağmen, çok çeşitli hizmetlerin geliştirilmesinde de kullanılabilen uygun bir destek araçtır. Bu çalışma, başlangıç aşamasında SERVQUAL modelini kullanarak otellerde sunulan hizmet kalitesini ölçen ve sonrasında KFG yaklaşımı ile otel misafirlerinin ve sunulması gereken hizmetin tasarım gereksinimlerini tanımlayan kavramsal bir modeli tanıtmaktadır. Kavramsal Kalite Oteli modeli üzerinde SERVQUAL ve KFG yaklaşımlarının bütünleştirilmesi örnek bir uygulama ile anlatılmıştır.

Anahtar Sözcükler: *Kalite Fonksiyon Göçerimi, SERVQUAL, Otel Hizmetlerinin Tasarımı, Kalite Oteli.*

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INTRODUCTION

In today's world, millions of dollars are spent for designing hotel services each year. Design is accepted as the main factor for intentional competition. In general, hotel practitioners and managers view design as only some aspects of hotel services such as interior design or Internet based services. There are few activities performed to get customer feedback. Moreover, there is a lack of using quality attributes to prioritize hotel service design based on customer feedback. Thus, it is essential to define a process, which will consider all aspects of services.

Interest in service quality has increased in the recent years, with a growing literature relating to the application of TQM concepts in the service industry. However, the measurement and improvement of service quality often remains a challenge (Babakus and Boller, 1992; Leblanc and Nguyen, 1997). SERVQUAL, developed by Parasuraman, Berry, and Zeithaml. (1990, 1991, 1993, 1994) is the most widely used and tested survey instrument to measure service quality dimensions (Pawitra and Tan, 2003). But, Parasuraman et al. (1990) do suggest that some adaptation of SERVQUAL scale may be desirable when a particular service is investigated. Quality Function Deployment (QFD) is a tailored process to analyze customer requirements in detail and translate them into the designers' language. QFD method is originally stemming from product development but it is also a suitable means to support the development of a wide range of services. In contrast to classic QFD for product development, the special characteristics of services have to be taken into account when applying QFD to service development. However, as shown in the literature review, there are few QFD applications or adaptations in service firms, especially for hotel and hospitality industry.

Therefore, this study aims at developing a conceptual QFD model adjusted for hotel services, which will bring valuable insights to both hotel/hospitality academicians and practitioners. This model is named as Hotel of Quality, which integrates the best elements of SERVQUAL and QFD methodologies.

LITERATURE REVIEW

Initiated by Shigeru Mizuno and Yoji Akao of the Tokyo Institute of Technology in the 1960s, the quality function deployment (QFD) was first applied at Mitsubishi Heavy Industries Limited in the Kobe Shipyard, Japan in 1972. Since then it has been successfully used in product and service design by many organizations. It is today established as an important quality tool in the design process (Akao, 1990; Mazur, 1994; Ekdahl and Gustafson, 1997).

QFD is a systematic process used by cross-functional teams in order to identify and resolve the issues involved in providing products, processes, services, and strategies that enhance customer satisfaction

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(González, Quesada, and Bahill, 2003). Akao (1990) defines QFD as a method for defining design qualities that are in keeping with customer expectations and then translating the customer requirements into design targets and critical quality assurance points that can be used throughout the production/service development phase (Akao,1990).

The QFD technique has been used to (Sangeeta and Karunes, 2004):

- Identify the presence of correlated design characteristics and customer requirements;
- Relate design characteristics in the form of quality aspects/components to the different customer requirements;
- Identify the minimum set of design characteristics able to cover all customer requirements.

Several publications illustrate different service QFD applications, some of them that are specific to the hotel industry are summarized in Table 1.

Table 1. QFD and Hotel Industry Literature Review

Authors	Approach	Attention to hotel services
Miyoung & Haemoon, 1998	Through a tentative example about hotel service and customer expectations attempted to show how to use QFD.	Special attention to hotel but without a deep study about guest expectations and hotel service types.
Pun et al., 2000	Discusses the QFD process, and addresses how service organizations identify customers' needs.	No attention to hospitality and hotel industry, combine QFD and Hoshin kanri techniques.
Zeithmal & Bitner, 2004; Fitzsimmons & Fitzsimmons, 2004	Introducing QFD as an approach for service design through an example.	No attention to hospitality and hotel industry.
Sangeeta et al., 2004)	Identifies the gap between customer expectations (students within selected educational institutions) and perceptions of the actual service received (the quality of those institutions) via SERVQUAL methodology. Then, determines the set of minimum design characteristics/quality components by QFD.	No attention to hospitality and hotel industry.
Key & Theresia, 2001	Proposes an integrated approach involving SERVQUAL, QFD and Kano's model that helps organizations to evaluate customer satisfaction, to guide improvement efforts in strengthening their weak attributes.	No attention to hotel industry but an actual case study from the tourist's perspective.

Benefits that arose from reported QFD applications include fewer design and service costs, fewer and earlier design changes, better company performance, improvement in service quality, and, above all, an increase in customer satisfaction (Franceschini and Rossetto, 1995; Kim, Han, Choi, and Kim, 1998). However, some researchers found a lack of quality management tools that could translate the customer needs into the service elements of an organization, mainly in the hotel and hospitality industry.

HOTEL OF QUALITY: THE ADJUSTED CONCEPTUAL MODEL

The House of Quality (HoQ) is a fundamental element of the QFD process, which provides a framework to relate customer needs to design characteristics at the product/service development level (Vivek, Cudney, Smith, Ragsdell, and Paryani, 2007). The traditional HoQ comprises six main steps. The process of completing the HoQ is described by (Mizuno and Akao, 1994).

The foundation of the house of quality is the belief that products or services should be designed to reflect customers' desires and tastes. The house of quality is a kind of conceptual map that provides the means for interfunctional planning and communications (Hauser, John, and Clausing, 1988). The HoQ starts with the customer needs and the customer competitive evaluations together with the level of importance that the customers assign to their needs and the way they rate the products/services against those of the competitors. These needs are translated into technical features by a relationship matrix that further deploys itself into a triangular correlation matrix and competitive technical assessments with its own set of operational goals and targets. The HoQ relates simply customer requirements, technical requirements and competitive analysis. The relationship matrix of HoQ shows the correlation between the customer requirements and the technical features so it is also called as the "planning matrix". It is crucial that the house of quality should be developed carefully since it becomes the basis of the entire QFD process. Indeed, the house of quality helps the team to set targets, which are, in fact, entered on the bottom line of the house. For engineers it is a way to summarize basic data in usable form. For marketing executives it represents the customer's voice. General Managers use it to discover strategic opportunities. In a nutshell, the house encourages all of these groups to work together to understand one another's priorities and goals (Hauser et al, 1988). The development of the conceptual model for this study began with the imagination a hotel instead of a house and the translation house sections into hotel components. The typical HoQ concepts were changed to meaningful ones to the hospitality industry. By using this metaphor, hotel managers and practitioners could better understand the QFD basics defined in hotel jargons. As shown in Figure 1, the customer needs or "whats" were replaced with the "Hotel Front Office", where is the guest expresses

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her/his expectations and wants. The "Hotel Back office" was used instead of the service design requirements which are called as "hows". That is why the back office is the place in which the hotel operations are performed in hotel people jargon.

The importance levels of the needs and the comparison rates with competitors were assessed in the "Customer Care Unit (CCU)". The relationships between "Front Office" and "Back office" were determined with the operations in the "Hotel Rooms". The functional interactions were assessed in the gable roof of the hotel. The last place is the hotel quality board where all of the assessments are integrated to determine the most important improvement.

In using QFD, it is essential to define the "Whats" and "Hows" according to the nature of the issue. The key question to be asked is "what" the customers' expectations would be from the hotel. Surveys, interviews with guests, organizing focus groups, gemba visits and content analysis are generally used in order to define the customer needs (Chow-Chua and Komaran, 2002; Gonzalez et al, 2004). This study uses SERVQUAL for primarily identifying the key dimensions of hotel service quality. SERVQUAL proposes five distinct dimensions to evaluate the service quality: reliability, responsiveness, assurance, empathy and tangibles. Table 2 shows the five dimensions of the SERVQUAL definitions adapted from (Zeithaml et al, 1990).

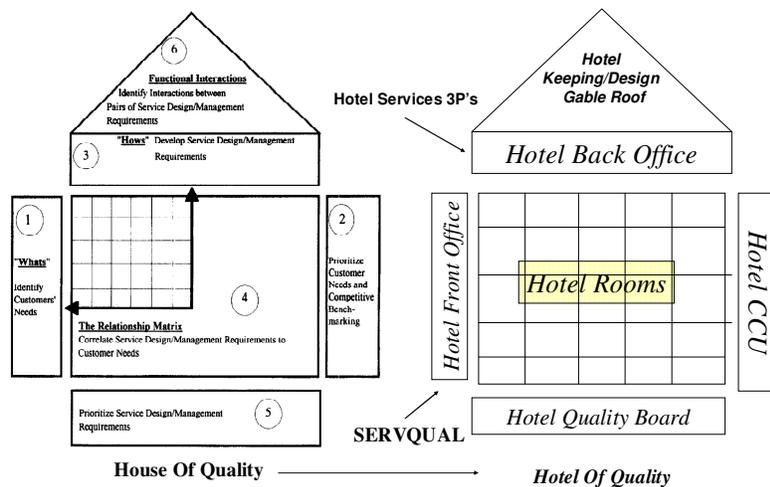


Figure 1. The Hotel Of Quality Concept

Table 2. SERVQUAL 5 Dimensions

Reliability	The ability to perform the promised hotel service dependably and accurately in a hotel.
Responsiveness	The willingness of hotel personnel both to help customers and provide prompt services.
Assurance	Knowledge and courtesy of hotel employees and their ability to convey trust and confidence.
Empathy	Ability to show caring, individualized attention to hotel customers.
Tangibles	Physical aspects of hotel services including the appearance of physical facilities, equipment, personnel and communications materials.

Source: Adapted from Zeithaml, V. A.; Parasuraman, A.; Berry, L. L.; *Delivering Quality Service: Balancing Customer Perceptions and Expectations*. The Free Press: New York, 1990.

Despite the wide usage of SERVQUAL by academics and practicing managers in various service industries, it needs to be modified based on the hotel customers' needs, i.e. customized according to the expectations of the guests. In literature, it is stated that only Miyoung and Haemoon (Miyoung and Haemoon, 1998) have used SERVQUAL in house of quality design to measure customer satisfaction in return for service quality. In this study, SERVQUAL has been modified to the hospitality industry and used in order to consider the guests' expectations and needs in the early stages of hotel service design. SERVQUAL includes 22 general items describing five service quality dimensions (Zeithaml et al, 1990). A pilot study has been conducted using these 22 items. Then the list including 17 items given in Table 3 has been obtained by omitting or changing some items based on the guests' feedback. This list describes the "whats" or the guests' expectations and needs from a hotel.

The "Hows" part of the Hotel Of Quality has been determined on the basis of service elements. The key question in this step is "how" the hotel would be able to deliver the required service(s) to its guests. For a production firm, it is easy to define the technical requirements based on the company's operational or managerial resource allocation plans. However for a hotel, if only the processes are considered, some important issues such as people and physical evidence aspects are ignored. Miyoung and Haemoon (1990) have only considered the hotel processes in their house of quality but not included the human factors and tangible representation of the hotel. The service mix not only includes the process itself, but also includes people and physical evidence (Zeithaml and Bitner, 2004). In this study, the 3P's (process, people and physical evidence) of service mix given in Table 4, is used to define the

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service design requirements. These requirements have been modified based on expert opinions and converted to the hotel equivalent. Elements such as IT and automation, check-out, employee behavior added to the service design requirements. The detailed version of the 3P's is shown in Table 5.

Table 3. SERVQUAL Adjusted Items Description

Reliability	Promising to provide a service and doing so
Responsiveness	Telling guests exactly when the services will be performed
	Always willing to help
	Never too busy to responding to guests' requests
Assurance	Feeling safe in the delivery of services
	Feeling safe and secure in their stay
	Having polite and courteous employees
	Having the knowledge to answer questions
	Having the skill to perform the service
Empathy	Giving individual attention
	Having guests' best interests at heart
	Understanding guests' specific needs
Tangibles	Modern looking equipment, fixtures and fittings
	Having neat and professional employees
	Comfortable fixture and fittings
	Generally clean equipment and facilities
	Having variety

Table 4 . 3P's - 3 Dimensions of Hotel Services Design Definition

Process	Actual procedure, mechanisms, and flow of activities by which hotel services are delivered- The hotel service delivery and operating systems.
People	All human actors who play a part in hotel services delivery and thus influence the guests' perceptions: namely, the hotel employees, the customers, and other customers in the service environment.
Physical Evidence	The environment in which the service is delivered and where the hotel and guests interact, and any tangible component that facilitate performance or communication of service.

Source: Adapted from Seth, N.; Deshmukh, S.G.; Vrat, P. (2005) Service Quality Models: A Review. International Journal of Quality ve Reliability Management, 22(9): 413-449.

Table 5. Detailed Version of the 3P's

Hotel Processes	IT & Automation	
	Front Desk	<ul style="list-style-type: none"> • Courtesy • Check-in/out
	Housekeeping	<ul style="list-style-type: none"> • Cleanliness • Timely Arrangement • Room Items In-Order
	Food & Beverage	<ul style="list-style-type: none"> • Food Quality • Sanitation • Employee Behavior • Process
	Complaint Handling	
Hotel People	Staff Behavior Training & Education Motivation Teamwork	
Hotel Physical Evidence	Interior Design Equipment Architect Employee Uniform Safety & Security	

Thus, the whole picture of the conceptual model of Hotel of Quality is given in Figure 2. As shown in Figure 2, all aspects of the Hotel of Quality are connected to guests' needs and the translation process of guests' requirements into hotel functions and elements has been defined in a systematic way.

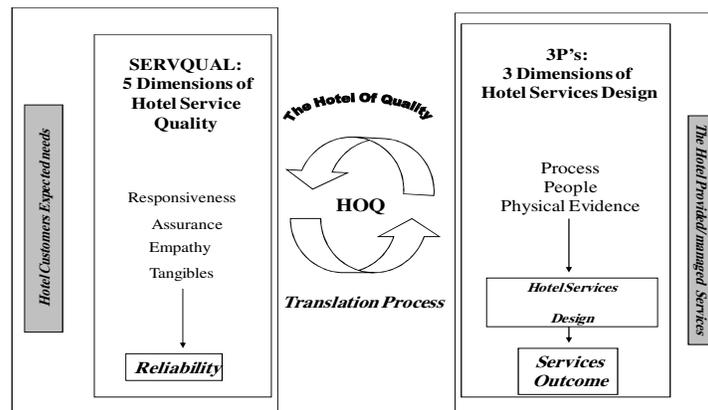


Figure 2. Hotel of Quality Translation Process

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HOTEL OF QUALITY: DESCRIPTIONS THROUGH A CASE STUDY

The following application case in a five star hotel will explain the steps of forming a hotel of quality with the mentioned approach. The steps of this translation process are given in Table 6 and the results of these steps are summarized in the Hotel of Quality in Figure 3.

Table 6. Steps to Create the Hotel of Quality

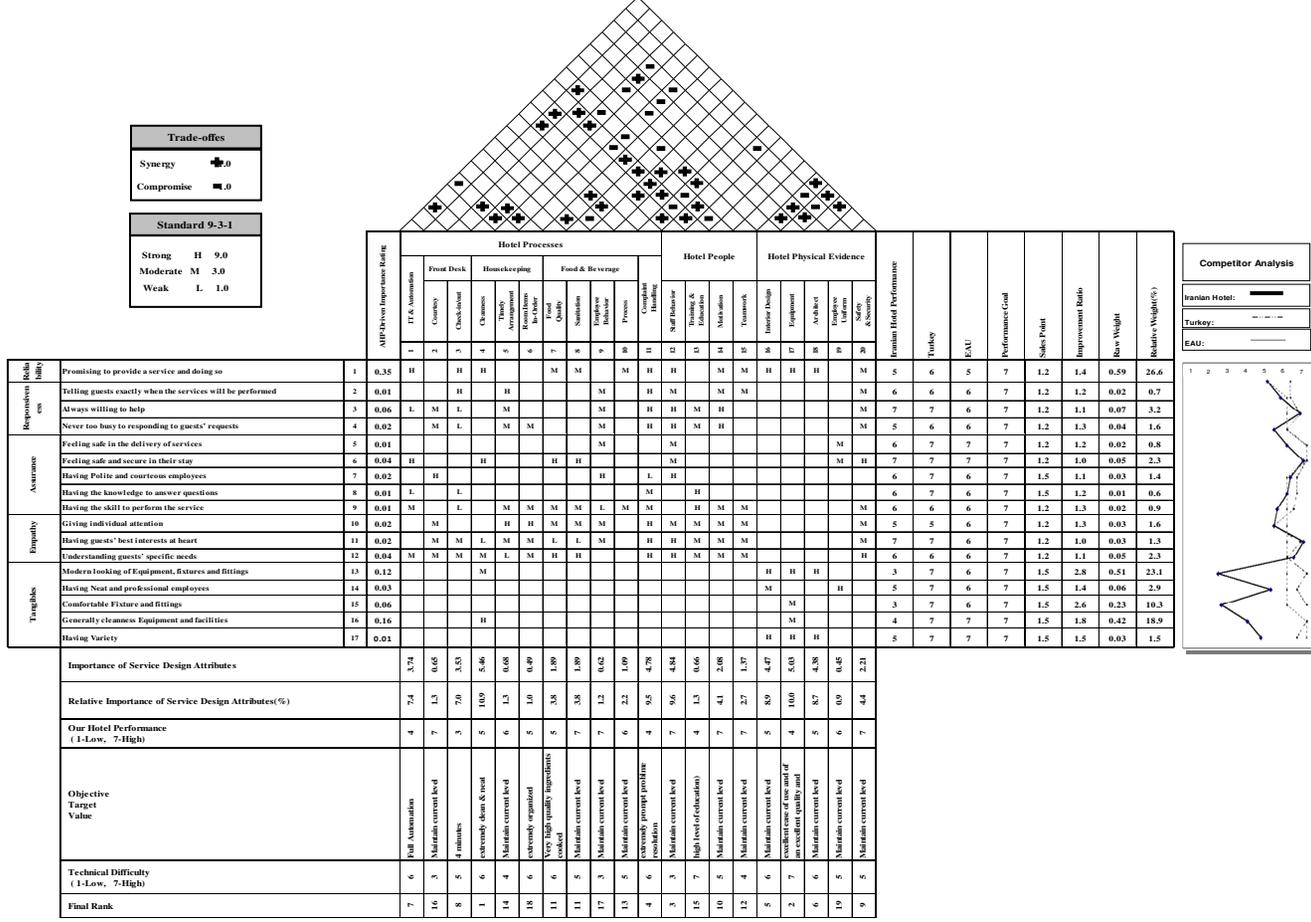
Step 1	Welcome to front office	Identifying customer needs.
Step 2	Process by hotel customers & competitors care unit	Prioritizing customer needs and conducting competitive.
Step 3	Work in hotel back office	Developing service design requirements.
Step 4	Checking in hotel rooms	Constructing the relationship matrix between customer needs and service design requirements.
Step 5	Decision making by hotel quality board	Prioritizing service design requirements.
Step 6	Working on the hotel gable roof	Determining interactions between pairs of service design requirements.

Step1- Welcome to Front Office: Identifying Guests' Needs

Customers tell all details of service attributes, but they do not know whether their words represent a requirement or not. These attributes or words may be a real requirement itself, or just a problem they have faced before or indicate a technical feature. In this study, a questionnaire based on 22 SERVQUAL items was designed and used to identify completely and successfully the guests' expectations and needs through personal interviews.

During the interviews, it was found that the "Promising to provide a service and doing so" quality attribute included well than other attributes among the reliability issues. Regarding the responsiveness, there were different expected waiting times depending on the various hotel services or types of customers. For the assurance attributes, the five star hotel guests had different opinions of rest; they expected a snug place. They imagined the hotel as their second home. The cultural differences caused a variety in understanding toward the empathy attributes. Eastern guests, such as Turkish people, have defined empathy as warm blood and cheerful faces but western guests, such as European people, have emphasized "Understanding guests' specific needs". The variety of services for instance foods, exterior and interior design were emphasized the most by guests. After modifications, the guests' needs were defined as the items in Table 3.

Figure 3 . Hotel of Quality for a Five Star Hotel in Iran



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Step 2- Process by Hotel Customers & Competitors Care Unit (CCU): Prioritizing Customer Needs and Conducting Competitive Analysis

Roozenburg and Eekels (1995) and Yan et al. (2005) also noted that the QFD can support the process from problem identification to design specification. In dealing with customer requirements, Saaty (1980) and Lu et al. (1994) recommended that designers apply analytic hierarchy process (AHP) to determine the importance degrees of customer requirements.

Therefore, we prepared a structured AHP form using items in Table 3, which enables the guest to make pair wise comparisons between the customer needs. Then, we had a short meeting with guests before they filled out the forms to make sure that all have the same understanding about the needs. Totally, eleven hotel guests were asked to assign a (integer) weight between 1 and 9 for the needs to reflect the importance of a need (say, A) relative to the other one (say, B). If B is considered more important than A, the inverse of the number is assigned. Even (intermediate) numbers are also used if it more accurately reflects the decision of the guest. Answers of seven hotel guests were found as consistent as compared with the consistency ratio of %20. Since this level is acceptable (Saaty, 2001), so that it is calculated the geometric mean of all the consistent answers for each cell of the pair wise matrix of the customer needs and then applied AHP procedure to reach customer importance levels for each need.

For performance and competitiveness analysis, the guests were asked to assess the hotels in Turkey and UAE in comparison with Iranian five star hotel performances. The assigned numbers indicated that the Turkish hotels and UAE hotels were rated better than the Iranian in assurance and empathy dimensions, and for tangibles the UAE hotels were rated better than Iran and Turkey. According to budget and hotel managers' points of view; the level of desired performance goal and sales point were assigned. In the Performance Goal column, hotel managers decides what level of customer performance they want to aim for in meeting with each customer need-the Goal. The performance goals are expressed in the same numerical scale as performance levels. The Goal performance, combined with our current rating, is used to set the Improvement Ratio. The Improvement Ratio, is one of the most important multipliers of importance to customer, thus, setting the performance goal is a crucial strategic step in QFD (Cohen, 1995). In addition, the Sales point column contains information characterizing the ability to sell the service, based on how well each customer need is met. The values assigned for sales point are 1 for "no sales point", 1.2 for "medium sales point" and 1.5 for "strong sales point". Then the relative weights for each guests' needs were determined. As shown in the Hotel of Quality of Iranian five star hotel (Figure 3), it is found that the most important attribute for guests was related to tangibles. The rightmost column in Figure 3 displays also the performance of this hotel with

respect to its competitors' situation by a graph. It is clear that this hotel exhibits lower performance than its competitors.

Step 3-Work in Hotel Back Office: Developing Service Design Requirements

The service elements were selected on the basis of service mix of 3Ps as mentioned in the previous section with some modifications, such as adding IT and complaint handling processes.

Step 4-Checking in Hotel Rooms: Constructing the Relationship Matrix Between Guest Needs and Service Design Requirements

In this step, the relationships between guest needs and service elements were determined according to the expert views which were obtained from hotel managers and employees. For this reason, we discussed in a group composed of people representing the divisions of: Front Desk, Reception Desk, Housekeeping, Food and Beverage, Hotel Architecture and Designer, Marketing and Hotel manager. We assigned the weight of the relationship between each "what" and each "how" using 9 for strong, 3 for moderate, and 1 for weak. In the actual HoQ, these weightings will be depicted with alphabetical symbols, the most common being H for strong, M for moderate, and L for weak. For instance, physical evidence strongly related to tangible elements. Front desk and Hotel People correlated strongly with responsiveness. Hotel people had no correlation with tangibles, but had a relationship with all the attributes.

Step 5- Decision Making by Hotel Quality Board: Prioritizing Service Design Requirements

The raw importance and relative weight of service design elements are computed by using the relative importance values and the relationship matrix developed in step 4. The accuracy of the results in this step relies heavily on the quality of the relationship matrix. The raw importance weight of each service design element is calculated by summing across the products of the relationship strength (i.e., the cell value assigned in the relationship matrix) and the relative weight of the guest need (i.e., AHP-Driven Importance Rating). This computation process intertwines guests' needs with service design requirements so that the resulting value gives the relative weight of each of the requirements as compared to guest needs.

According to the relative weights, Cleanliness, Equipment, Staff Behavior and Complaint Handling have greater priority more than others in this case. Therefore, the hotel quality board should consider primarily these hotel service design projects. In addition, according to hotel experts' view, we stated Objective Target Values and related Technical Difficulty. Objective Target Values are indications as to how much of some technical characteristic the customer wants. This information can help hotel managers when they want to deploy service design projects.

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Step 6- Walking on Hotel Gable Roof: Determining Interactions Between Pairs of Service Design Requirements.

The final step of the Hotel of Quality is for management to determine the degree of the functional relationship for each pair of service design elements. We defined the trade-offs through symbols in the roof. For instance, IT & Automation has a synergy relationship with Check-In/Out. Also, cleanliness has a synergy relationship with Timely Arrangement, Room Items in Order, Training-Education and Equipment. Other functional relations are shown in the gable roof of the Hotel of Quality. By considering these relationships, managers could see the effects of any design change in one element to other elements.

CONCLUSION AND SUGGESTIONS FOR FURTHER RESEARCH

This study has attempted to develop a conceptual Hotel of Quality model for hotel services and to relate the hotel characteristics and hotel practitioner jargons to this model. For the development of "whats" based on hotel guest needs, the modified version of SERVQUAL was used. Regarding the "hows" of the Hotel of Quality, the 3Ps of service mix were used to consider all aspects of hotel services. After defining the conceptual model, a case study was presented for application and verification in a five star hotel.

The Hotel of Quality includes a six-step process. In the first step, the service quality attributes were checked. Guests interviews determined that the SERVQUAL items were applicable and understandable; however needed some modifications specific for this industry. By using a structured AHP form, the customer importance levels were obtained in the second step. In third step, the proposed elements of hotel services were checked via experts' opinions and some modifications over these elements were made accordingly. The fourth step demonstrated the relationship matrix and some important relations that must be considered by any design activities. The fifth step brought valuable insights for the managers regarding service design priorities. Thus, they considered the interaction between elements of service and their effects to each other.

Hotels do face different types of guests such as businessmen, tourists, political guests, etc. with different expectations. The generalization of this study to all hospitality industry is limited because it was performed on a five star hotel. On the other hand, there is a need to add some powerful data processing tools to the proposed technique. Future research can benefit upon this study by expanding the scope from hotel industry to other type of industries in order to analyze the applicability of the proposed tools; and applying the same methodology to other type hotels for developing a model for customer-oriented hospitality structures and also applying the four phases of QFD in the hotel or other industries.

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