# Structural Equations Method for the Analysis of the Quality of Service in the Hotel Industry

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**Abstract**
This article examines the quality of service experienced at the Sonesta Loja hotel in Ecuador. We calculated an overall guest satisfaction index using a model consisting of four constructs and four hypothesized relationships that are tested through the Structural Equation Method using ADANCO software. Data were obtained from a survey applied to a sample of 334 guests between March 2019 and March 2020. The results show that tangible and intangible elements have a high significance on the perceived value, and this, on the level of satisfaction. Lodging facility managers can use the findings to identify meaningful attributes to guests, allowing them to redirect and provide specific guidelines to increase perceived quality. Loja hotel industry can use the results to improve the competitiveness of the accommodation sector and establish specific service marketing strategies.

**Keywords**
service quality, intangible elements, tangible elements, level of satisfaction, perceived value, and small and medium-sized enterprises.

## 1. Introduction

This article focuses on one of the tourism service industries that has seen the most significant development in recent years: the lodging industry. This fact has generated the need to integrate tools that make it possible to determine the factors and criteria users consider when evaluating the quality of service. The purpose is to obtain indicators contributing to the design and management of competitive strategies [1], [2].

The services sector has played an essential role in countries' economies worldwide. It currently generates more than two-thirds of the world's gross domestic product -GDP- and is the primary source of employment [3], [4]. Therefore, the economy is focused on service activities, unlike in the past, when the economy was centered on goods-producing companies [5]. These changes have led to the growth of the offer with an increasing number of companies. However, one of its primary needs is incorporating quality management tools with a vision oriented to customer satisfaction.

Services are considered intangible economic activities, so the generation of value is associated with immediate consumer sensations [6], [7]. Today's customers are more demanding and critically value the factors that meet their needs. These factors may come not only from your perception but may also be motivated by other people [8], [9]. In addition, external factors (social, political, cultural, and technological) influence the purchase decision.

Companies must determine the tangible and intangible factors that affect their customers' perception of service quality, image, and reputation [10], [1]. Consequently, they must adopt new marketing strategies focused on innovation to meet current and future customer needs to be based on market analysis, consumer behavior, and trends.

The services sector includes tourism companies, which are considered one of the activities with solid growth potential. In Ecuador, according to the Ministry of Tourism, in 2019, the contribution of tourism companies to GDP was 2.1%. In this context, accommodation and food and beverage service companies generated 477 382 jobs, representing 6.1% of total employment. Those data highlight the opportunity to create new local enterprises in the services area.

Recent research has evaluated the effects of service quality that directly and indirectly affect hotel customer loyalty and purchase intent [11]. The results obtained through surveys and applied analysis techniques showed the correlation between service quality and loyalty in purchase intention. This means that the service quality and loyalty variables have a significant influence as determining factors in purchase intention. Moreover, quality has a more significant impact on purchase intention. Therefore, hotel owners must provide quality service to impact consumer loyalty directly and sustain purchase intent. [12] oriented his research to evaluate the experience of tourists through satisfaction with the services received. He correlated satisfaction with other variables by applying structural equations to the data collected, obtaining important information about the offer and quality of the services provided. For example, the survey allowed analyzing factors related to expectation, quality, satisfaction, value, complaint handling, and tourist loyalty. The results showed a significant relationship between quality, value, and consumer satisfaction. Also, the results evidenced a high and positive relationship between customer satisfaction and loyalty.

This study contributes to the literature on consumer behavior and the theoretical and empirical evidence on evaluating service quality in lodging establishments. For this purpose, the paper is structured as follows: first, the research question and hypotheses are established; second, we develop the methodology used and the sampling characteristics. Finally, the results, discussion, and conclusions are proposed.

## 1.1. Research question and hypothesis

Based on the literature review conducted, the research questions are aimed at determining the influence that tangible and intangible elements of the establishment have on the perceived value of guests and the extent to which perceived value affects the level of satisfaction. For this purpose, we have developed the following hypotheses:

H1: There is a positive relationship between tangible elements and perceived value.
H2: There is a positive relationship between intangible elements and perceived value.
H3: There is a positive relationship between perceived value and satisfaction level.
H4: There is a positive relationship between tangible elements and the level of satisfaction.

## 2. Methodology

## 2.1. Population and sample

The study population is composed of the guests of the Sonesta Loja hotel. This establishment is in the city of Loja, in southern Ecuador, has a five-star category, and is operated by the company Grupo Hotelera Londoño (GHL). This company operates its brands and international franchises in 13 Latin American countries. Currently, GHL operates 72 hotels that share the same service standards.

The data comes from a survey of 735 guests from March 2019 to March 2020. In the initial verification process, it was observed that there were sections that the respondents had not answered. In this regard, to ensure the availability of representative and complete information, the following inclusion criteria were considered: i.) surveys during the period March 2019 - March 2020, ii.) all the questions that make up the different sections or blocks were answered, and iii.) surveys conducted through the REVINATE system. In summary, the sample consisted of 334 observations that met the inclusion criteria.

## 2.2. Instruments

The questionnaire application is one of the techniques of most outstanding contribution. In this case, it was applied online through the REVINATE system that collects the guest's opinion once their stay is over. The system sends an e-mail to each client with the survey and a statement of reasons, highlighting the importance of filling it out. Once answered, the guest's opinion is received, stored, and tabulated. This process facilitates descriptive statistical analysis. The Quality Manager coordinates its use within the company.

The researchers managed the authorization to have access to the REVINATE reports. The data are compatible with EXCEL spreadsheets, through which we proceeded to reorganize the variables to adapt them to the structure required by the proposed model. The questionnaire consists of 50 questions grouped into ten blocks, including four sociodemographic questions.

## 2.3. Analysis method

As a result of an exhaustive review of the existing tourism literature, 46 variables were grouped into four constructs (dimensions) to form the structural equation model (SEM): tangible elements, intangible elements, perceived value, and satisfaction. Following [13] 's proposal, an SEM was formulated using ADANCO software to test the hypotheses. According to [14], SEM tests for causal paths between latent variables and measures the collective strength of a set of variables. The path analysis through mediation assumes that one or some variables can influence an outcome directly and indirectly through another variable [15]. According to our hypotheses, Figure 1 shows a model where TE and IE influence directly to PV and indirectly influence SL through PV; also, TE could affect directly to SL.
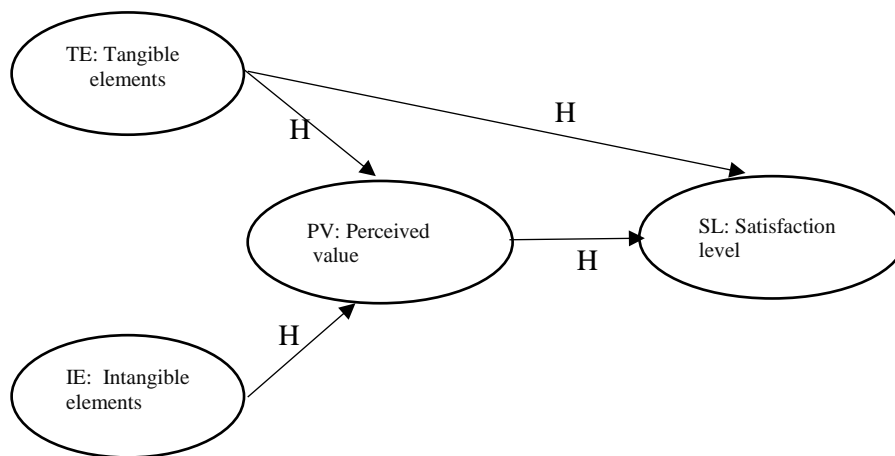


**Figure 1:** A proposed theoretical model

Following the procedure, the stability and consistency of the model variables were evaluated using ADANCO software. Finally, through the same ADANCO, the final analysis is carried out using the Structural Equations Method (SEM), which assesses the interrelationships of the variables and tests the proposed hypotheses.

## 3. Analysis and results

### 3.1. Reliability analysis

Reliability analysis evaluates the consistency of the variables measured in each construct. For this, a standardized loading on each variable greater than 0.707 is recommended [16], [17], [18]. However,

we decided to include only those variables with a Cronbach's alpha >0.6, following the recommendations of some researchers who point out that, for studies in initial phases, a value of 0.600 is sufficient [19], [20], [21]. In addition, variables are essential to retaining construct validity [22]. Our results have values between 0.649 and 0.828 which shows acceptable construct reliability (See Table 1).

**Table 1**
Scale reliability of the dependent and independent variables.

| Independents Variables | | Charge |
|---|---|---|
| TE | *Perceived quality in tangible elements* | |
| CTE5 | Condition of room furnishings | 0.775 |
| CTE6 | Condition and comfort of the room's bathroom | 0.676 |
| CTE7 | Room maintenance (floor and walls) | 0.772 |
| CTE8 | Comfort of the bed | 0.727 |
| CTE9 | Ease of working in the room | 0.719 |
| CTE10 | Room cleanliness | 0.784 |
| CTE11 | Room tidiness on time | 0.692 |
| CTE12 | Bed arrangement | 0.769 |
| CTE13 | Maid presentation | 0.733 |
| CTE14 | Bathroom cleanliness | 0.753 |
| IE | *Perceived quality in intangible elements* | |
| CIE4 | Greeting and friendliness of the reception staff at the time of check-in | 0.684 |
| CIE5 | Waiting time at the reception desk for registration | 0.769 |
| CIE6 | Speed of check-in process at the front desk | 0.649 |
| CIE18 | Waiting time at the check-out counter for the check-out process | 0.745 |
| CIE19 | Speed of check-out process at the front desk | 0.751 |
| CIE20 | Assistance with departure requests | 0.724 |
| CIE21 | Greeting and friendliness of front desk staff at check-out time | 0.748 |
| **Dependent Variables** | | |
| PV | *Perceived value* | |
| PV1 | Value | 0.711 |
| PV3 | Employee responsiveness to your needs | 0.801 |
| PV5 | Check-in/registration experience | 0.766 |
| PV9 | Experience with check-out | 0.728 |
| SL | *Level of satisfaction* | |
| SL2 | Cleanliness of the facility | 0.747 |
| SL4 | Rooms in the establishment | 0.778 |
| SL5 | Service | 0.828 |
| SL6 | Quality of rest | 0.812 |

*Note.* All questions were averaged on a Likert scale of 1-10, with 1 being "Completely dissatisfied" and 10 being "Completely satisfied".

## 3.2. Measurement of model

The model proposed by the research hypothesizes the existence of four significant causal relationships between four dimensions, namely, i.) tangible elements, ii.) intangible elements, iii.) perceived value, and iv.) level of satisfaction.

The consistency of the constructs that make up this model was determined through the reliability process. This process was done from an analysis of the level of significance and reliability, taking into consideration Dijkstra-Henseler's rho ($\rho$A), Jöreskog's rho ($\rho$c) and Cronbach's alpha($\alpha$), as shown in Table 2.

**Table 2**
Significance of model constructs and reliability results.

| Construct | Dijkstra-Henseler's rho ($\rho_A$) | Jöreskog's rho ($\rho_c$) | Cronbach's alpha($\alpha$) |
|---|---|---|---|
| IE | 0.8566 | 0.8857 | 0.8506 |
| PV | 0.7478 | 0.8388 | 0.7444 |
| SL | 0.8125 | 0.8707 | 0.8029 |
| TE | 0.9131 | 0.9239 | 0.9085 |

The results in Table 2 show acceptable consistency and reliability. Most of the indicators are more significant than 0.8, except the perceived value (PV), which was 0.7444. Looking specifically at the assessment of the model through Dijkstra-Henseler's rho ($\rho$A) shows that high composite reliability is available with values above 0.7 and below 0.9, which is the expected range for composite models [23].

By determining the average variance extracted (AVE), the results show each of the constructs with an indicator greater than 0.5, thus meeting the criterion established for this factor [24]. According to discriminant validity, IE has an AVE of 0.5261, PV is 0.5658, SL 0.6277, and IE obtained 0.5490. These indicators confirm that the model is reliable and the results are consistent (see Table 3).

**Table 3**
Discriminant validity results associated with the model.

| Construct | IE | PV | SL | TE |
|---|---|---|---|---|
| IE | **0.5261** | | | |
| PV | 0.1146 | **0.5658** | | |
| SL | 0.0539 | 0.4424 | **0.6277** | |
| TE | 0.0584 | 0.1176 | 0.1017 | **0.5490** |
| Squared correlations (AVE in the diagonal) | | | | |

Regarding the direct effects between the constructs of the model, the significance between variables was evaluated through p-values. Table 4 shows that the significance between the perceived quality of the intangible elements (IE) of the Hotel Sonesta Loja establishment and the perceived value (PV) is less than 0.01, which indicates that the relationship between these two constructs is significant at 99%. It is also true between perceived value (PV) and level of satisfaction (SL), as well as between tangible elements and perceived value. On the other hand, when analyzing the direct effect between the tangible elements (TE) and the level of satisfaction (SL) of the clients of the Hotel Sonesta Loja, the p-value was less than 0.05 (p-value=0.0236), which determines a significant linkage at 95%. Therefore, H1, H2, H3 and H4 are accepted.

**Table 4**
Inference of direct effects between each of the constructs of the resulting model

| Effect | Original coefficient | Standard bootstrap results | | | | |
|---|---|---|---|---|---|---|
| | | Mean value | Standard error | t-value | p-value (2-sided) | p-value (1-sided) |
| IE -> PV | -0.2714 | -0.2923 | 0.0672 | -4.0390 | 0.0001 | 0.0000 |
| PV -> SL | 0.6298 | 0.6320 | 0.0584 | 10.7773 | 0.0000 | 0.0000 |
| TE -> PV | -0.2773 | -0.2803 | 0.0611 | -4.5406 | 0.0000 | 0.0000 |
| TE -> SL | -0.1030 | -0.1076 | 0.0518 | -1.9870 | 0.0472 | 0.0236 |

In general, the model developed for the Sonesta Loja Hotel is consistent and reliable. The tangible and intangible elements significantly impact the perceived value, which, in turn, on satisfaction.

## 4. Discussion and Conclusions

The system for measuring aspects associated with the quality of service provided by the Hotel Sonesta Loja has redundant approaches and lacks others that could provide better information. That agrees with [1], [2], who mentions the importance of having tools that allow determining the factors that customers consider when measuring service quality.

The significance values determined for the relationship between the different constructs allowed us to conclude that there is a very significant link between the perceived value and the level of satisfaction in the clients of Hotel Sonesta. That fact enables inferring that customers make an evaluation considering the relationship between the quality of the service received and the price [10], [1]. The fact that there is a very significant relationship between tangible elements and perceived value reinforced that derivation. Therefore, some relevant details for hotel guests are the room's cleanliness, the condition of the room furniture, and the bed arrangement.

Concerning the quality of intangible elements and perceived value, there is a very significant link between these constructs. Specifically, guests' waiting for time check-in or check-out, as well as the friendliness of the staff, are relevant to the customers' perception of the quality of the service-price relationship [6], [7]. The tangible elements of the hotel and their associated quality have a significant relationship with the level of customer satisfaction. In other words, guests consider the cleanliness and tidiness of the rooms to be decisive for their rest.

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