

# Customer Satisfaction Evaluation At Sapadia Guest House Through Servqual And Csi Approaches Based On Information Systems

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## Abstract.

*This study aims to evaluate customer satisfaction levels at Guest House Sapadia by integrating the SERVQUAL method and the Customer Satisfaction Index (CSI) within an information system-based framework. The SERVQUAL method is employed to assess service quality across five core dimensions: Tangibles, Reliability, Responsiveness, Assurance, and Empathy. Concurrently, the CSI method provides a quantitative overview of overall customer satisfaction, grounded in the perception and relative importance of each service attribute. Data were collected via an online questionnaire completed by 184 respondents and processed through a web-based information system to generate interactive visualizations and automated analyses. The results indicate that Guest House Sapadia achieved a CSI score of 84.57%, which falls under the "satisfied" category, with the Assurance and Reliability dimensions receiving the highest ratings. However, the Tangibles and Responsiveness dimensions require improvement. This study offers strategic recommendations for service enhancement and demonstrates that the implementation of information technology can significantly streamline and facilitate continuous customer satisfaction evaluation.*

**Keywords:** Customer satisfaction; SERVQUAL; Customer Satisfaction Index (CSI); information system and Guest House Sapadia.

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## I. INTRODUCTION

The hospitality industry is currently experiencing heightened competition due to the increasing expectations of customers regarding service quality and facility standards. At both national and global levels, customer satisfaction has emerged as a critical strategic indicator in evaluating the performance of service-based institutions, including hotels and other forms of accommodation [1], [2] A substantial body of research has emphasized that service quality constitutes a key determinant of both customer satisfaction and loyalty. According to [3], the assurance and empathy dimensions exert a significant influence on customer satisfaction in the hotel sector, as these dimensions reflect guests' trust in the competence of hotel staff and the attentiveness provided to them. In response to the need for objective assessments, index-based analytical approaches have been increasingly employed to measure customer satisfaction quantitatively. For instance, [4] proposed the Hotel Customer Satisfaction Index (H-CSI), an adaptation of the American Customer Satisfaction Index (ACSI) that incorporates emotional factors of consumers into its framework. Their findings indicate that elements such as safety, security, and the intensity of guest-staff interactions are crucial in determining satisfaction levels, particularly in four- and five-star hotels. On a local scale, specifically in Medan, North Sumatra, Tourism, and hospitality sectors have witnessed rapid growth in conjunction with the rising influx of both domestic and international tourists.

As a major metropolitan area in Indonesia, Medan holds considerable potential in the accommodation industry. Recent statistics reveal that the city hosts 195 hotels, comprising 51 star-rated and 144 non-star-rated establishments. The occupancy rate for star-rated hotels reached 53.19% in November 2023, with four-star hotels outperforming five-star ones. In this context, guest houses are becoming increasingly favored for offering comfortable services at more affordable rates, without significantly compromising quality. Sapadia Guest House, located in Medan, serves as an example of a lodging provider that continuously innovates to enhance its service quality and facilities. The establishment has adopted a web-based service platform that enables customers to access information, make reservations, and submit

feedback. This digital system not only facilitates interaction between guests and management but also serves as an evaluative instrument for assessing customer satisfaction.

The implementation of the Customer Satisfaction Index (CSI) methodology is particularly relevant in this setting, as it provides a standardized numerical evaluation of satisfaction levels. Prior research conducted at Rudang Hotel Berastagi demonstrated the efficacy of the CSI approach in evaluating services and identifying attributes in need of improvement [5]. Similarly, a study at Delihomestay Medan yielded a CSI score of 70.22%, indicating a “satisfied” category, though highlighting the need for improvements in staff hospitality and room cleanliness [6]. Nevertheless, existing CSI applications often rely on manual data processing or spreadsheet-based tools, which limit efficiency and interactivity. As noted by [7], the effectiveness of the CSI methodology can be significantly enhanced through the integration of information systems that incorporate digital questionnaires and automated index computation based on attribute weighting. Considering the considerations, this study aims to implement the CSI method at Sapadia Guest House with the support of a web- or desktop-based information system. This approach is expected to facilitate more accurate, efficient, and informative customer satisfaction analyses, thereby supporting continuous service improvement, and enhancing competitiveness in the dynamic hospitality industry landscape.

## II. METHODS

### Experimental (or Materials and Methods)

This study utilizes a quantitative descriptive approach to measure customer satisfaction at Sapadia Guest House by assessing service quality using the SERVQUAL model and the Customer Satisfaction Index (CSI). The SERVQUAL framework evaluates five dimensions of service quality: reliability, responsiveness, assurance, empathy, and tangibles, by measuring the gap between customer expectations and perceptions [8], [9], [10], [11]. The CSI complements this by quantifying the relative importance and performance of each dimension to produce an overall satisfaction index [12], [13]. Data were collected via an online questionnaire distributed to guests who stayed at Sapadia Guest House within the last 12 months.

Purposive sampling was applied, targeting a minimum of 180 respondents to ensure statistical validity. The questionnaire used a 7-point Likert scale to capture both expectation and perception scores for 22 items covering the five SERVQUAL dimensions. Importance weights were assigned to each dimension for CSI calculation. Analysis involved computing the service quality gap by subtracting expectation scores from perception scores and calculating the CSI as a weighted score reflecting overall satisfaction. Results were visualized through an interactive web-based dashboard displaying radar charts, bar graphs, and pie charts to facilitate real-time evaluation by management. This method allows for objective measurement and comprehensive analysis of customer satisfaction to guide service improvement strategies.

## III. RESULT AND DISCUSSION

### Respondent Data Description

An online survey integrated with the information system collected 184 valid questionnaires out of 191 responses. The sample size exceeds the Krejcie-Morgan recommended minimum of 169 respondents for a population of 300, ensuring a reliable 95% confidence level [14].

**Table 1.** Respondent Data

Variable	Category	Number of Respondents	Percentage (%)
<b>Gender</b>	Male	99	53.8
	Female	85	46.2
<b>Age Group</b>	18–24 years	42	22.8
	25–34 years	70	38.0
	35–44 years	44	23.9
	≥ 45 years	28	15.2
<b>Purpose of Visit</b>	Leisure	79	42.9

Variable	Category	Number of Respondents	Percentage (%)
<b>Length of Stay</b>	Business Trip	59	32.1
	Family Matters	46	25.0
	1–2 nights	88	47.8
	3–4 nights	68	37.0
	≥ 5 nights	28	15.2

As shown in Table 1, the respondent profile was relatively balanced by gender, with males constituting 53.8%. The largest age group was 25–34 years old (38%), suggesting higher digital engagement among younger adults. Most visits were for vacation purposes (43%), followed by business (32%) and family reasons (25%). The majority stayed 1–2 nights (48%), indicating the guest house primarily serves short-term or transit guests. These demographics reflect a diverse market segmentation relevant to service strategy[15].

### Survey Instrument and Dimensions

The questionnaire was developed based on the well-established SERVQUAL model, which measures service quality through five key dimensions: Tangibles, Reliability, Responsiveness, Assurance, and Empathy.

**Table 2.** List of respondent questions

Dimension	No.	Question
<b>Tangibles</b>	1	The physical facilities of the Guest House look attractive and up to standard.
	2	The equipment used in the Guest House is in good condition and well-maintained.
	3	The Guest House staff appear neat and professional.
	4	The surroundings of the Guest House are clean and comfortable.
<b>Reliability</b>	5	The Guest House provides services as promised, accurately.
	6	Services are delivered on time without delay.
	7	Guest House staff are reliable in solving problems.
	8	Service errors are handled quickly and thoroughly.
<b>Responsiveness</b>	9	Staff are quick in providing assistance and services.
	10	Staff are willing to help guests attentively.
	11	Information provided by the staff is clear and easy to understand.
<b>Assurance</b>	12	Guest House staff are polite and friendly.
	13	Staff have sufficient knowledge to answer guests' questions.
	14	I feel safe during my stay at the Guest House.
	15	Staff are able to assure guests through their competence and professional behavior.
<b>Empathy</b>	16	Staff pay attention to the individual needs of guests.
	17	Service hours match the needs of the guests.
	18	Staff provide attentive and personalized service.
	19	Guests feel valued and well-treated by the staff.
	20	The Guest House provides facilities that support guests during their stay.
	21	Staff strive to understand guests' desires and problems.
	22	Communication between staff and guests is smooth and effective.

Respondents rated 22 items related to these dimensions using a 7-point Likert scale, reflecting their actual experience during their stay (see Table 2 for item details). This instrument allows a comprehensive assessment of service quality from the guest's perspective [16].

### Instrument Validity and Reliability

Before the main survey, the questionnaire was tested to ensure it accurately measures service quality and produces consistent results. Validity was assessed using the Corrected Item-Total Correlation method on 30 initial respondents. As shown in Table 3, all 22 items had correlation values (0.512–0.812) exceeding the minimum threshold (0.149), confirming each item effectively represents the intended dimension.

**Table 3.** Instrument Test

Test	Result	Criteria	Decision
<b>Item Validity</b> (n = 22)	r-count 0.512–0.812 > r-table 0.149	Corrected item-total correlation	All items are valid
<b>Reliability</b>	Cronbach's $\alpha = 0.926$ (overall)	$\alpha > 0.70$ (Nunnally)	Highly reliable

Reliability was evaluated using Cronbach's Alpha, which yielded a high score of 0.926, indicating excellent internal consistency across all items. This means the instrument reliably captures respondents' perceptions and is suitable for use in this study.

### **SERVQUAL Analysis Results**

The analysis of the SERVQUAL dimensions shows that respondents rated all service aspects as important, with average importance scores ranging from 5.90 to 6.06 on a 7-point scale. As detailed in Table 4, Empathy holds the highest importance score (6.06), emphasizing the value guests place on personalized care. Assurance leads in performance with an average score of 5.65, reflecting strong guest confidence in staff competence and professionalism. Meanwhile, Tangibles scored lowest in performance (5.40), indicating a need for improvement in physical facilities and environment.

**Table 4.** Average Customer Satisfaction in numbers

Dimension	Average Importance (1-7)	Average Performance (1-7)
Tangibles	6.02	5.40
Reliability	5.90	5.53
Responsiveness	6.05	5.56
Assurance	6.05	5.65
Empathy	6.06	5.53

This gap between importance and performance across dimensions suggests opportunities for targeted service enhancements to better meet guest expectations.

### **Customer Satisfaction Index (CSI)**

The Customer Satisfaction Index (CSI) is calculated by multiplying the average importance weight ( $I_d$ ) and the average performance score ( $K_d$ ) for each SERVQUAL dimension to get a weighted score ( $WS_d = I_d \times K_d$ ). The total CSI is then obtained by summing all weighted scores across the five dimensions, dividing the sum by 7 (the maximum score on the Likert scale), and multiplying by 100% to convert to a percentage:

$$CSI = (\sum WS_d \text{ for } d=1 \text{ to } 5) / 7 \times 100\%$$

**Table 5.** Average importance and performance data per dimension

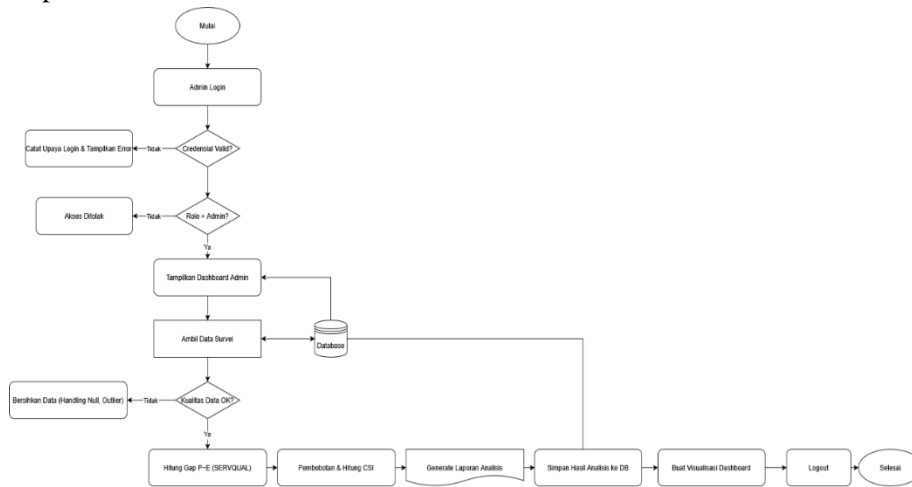
Dimension	Importance (I)	Performance (K)	Weighted Score
<b>Tangibles</b>	0.18	5.99	1.078
<b>Reliability</b>	0.22	6.00	1.320
<b>Responsiveness</b>	0.21	5.84	1.226
<b>Assurance</b>	0.19	6.03	1.146
<b>Empathy</b>	0.20	5.75	1.150
<b>Total</b>	1.00		<b>5.920</b>

The data in Table 5 shows the importance weights, average performance scores, and weighted scores for each dimension. The total weighted score sums to 5.920, resulting in a CSI of 84.57%. According to Aprillia, Primasanti, and Indriastiningsih (2022), a CSI between 75% and 84% is classified as "Satisfied," while a CSI of 85% or above indicates "Very Satisfied." Therefore, with a CSI of 84.57%, guests at Sapadia Guest House are considered satisfied, nearing the very satisfied category, implying good overall satisfaction with room for improvement.

### **System Development and Use Case Overview for Customer Satisfaction Analysis**

This study presents the development of a system designed to analyze customer satisfaction levels by integrating the Servqual method and the Customer Satisfaction Index (CSI) as the primary quantitative approaches for measuring service quality and customer satisfaction. The system workflow, illustrated in Figure 1, begins with customers completing a questionnaire that includes indicators based on the five

dimensions of Servqual alongside CSI elements. The collected data is processed to calculate the Servqual score—reflecting the gap between customer perceptions and expectations—and the Customer Satisfaction Index, weighted according to the importance of each indicator. Subsequently, the system analyzes service gaps and aggregates the data to derive an overall satisfaction score, providing a quantitative basis for evaluating service performance.



**Fig 1.** System Flowchart

The final result of the analysis is presented through an interactive dashboard designed to visualize key performance indicators using various graphical elements such as charts, graphs, and data tables. This dashboard plays a critical role in enabling the management team to monitor customer satisfaction metrics in real time. By presenting insights in an intuitive and visually engaging format, the dashboard helps decision-makers quickly grasp trends, identify service-related issues, and make data-driven adjustments to improve customer experience. The integration of real-time data visualization ensures that any fluctuations in customer sentiment can be promptly addressed, thus enhancing responsiveness and service quality.

In addition to data visualization, the system incorporates a structured workflow that spans from data input and preprocessing to secure user access and role-based control. This ensures that sensitive customer feedback is handled with appropriate safeguards, maintaining both data integrity and confidentiality. The system architecture supports operational efficiency by automating the stages of data collection, analysis, and output presentation. Furthermore, detailed system flow diagrams and user interaction schematics—illustrated in Figures 1 and 2—offer a comprehensive overview of how users interact with the system and how data moves through various processing stages. These visual aids help clarify the system's design and highlight the seamless integration between backend processes and front-end user access.



**Fig 2.** use case diagram

The use case diagram in figure 2 presents the essential features of the customer satisfaction analysis system by illustrating the interactions between different user roles and system elements. The main users of the system include the Administrator, Analyst, and General User, each engaging with the system according to their specific access levels and responsibilities. The Administrator is responsible for user management, configuring access permissions, and maintaining overall system settings. This role plays a key part in safeguarding the system by ensuring that only authorized users have access to critical data and system operations. The Analyst uses the system to carry out data analysis, create reports, and display key performance indicators related to customer satisfaction. Through clearly defined use cases, the Analyst can upload raw data, carry out preprocessing tasks, and run analytical models. The General User, typically from the management team, primarily uses the interactive dashboard to review real-time analytics. Their role is limited to viewing visual outputs like graphs and tables, without the ability to modify the underlying data. Overall, the use case diagram clearly defines how each user interacts with different system features, promoting a secure and organized process for monitoring customer satisfaction and supporting strategic decision-making.

### Summary

The findings emphasize the critical role of empathy and assurance in guest satisfaction while pointing to physical facility upgrades as a key focus area. This insight can guide management in prioritizing service enhancements to maintain and improve guest experience.

## IV. CONCLUSION

The results of this study indicate that customer satisfaction at Sapadia Guest House is at a favorable level, with a Customer Satisfaction Index (CSI) score of 84.57%. This value places customer satisfaction in the “satisfied” category, very close to “very satisfied” ( $\geq 85\%$ ), suggesting that the services and facilities generally meet guest expectations but still leave room for improvement. Quantitative analysis shows that the highest performance was recorded in the dimensions of Assurance and Reliability, reflecting positive perceptions of service consistency and staff competence. On the other hand, Responsiveness and Empathy scored relatively lower, highlighting a need for improvement in how staff respond to guest needs and in delivering more personalized service.

Significantly, the CSI score of 84.57% implies that although the current service quality is adequate, a strategic push focused on weaker dimensions could meaningfully raise overall satisfaction. Based on these findings, the following recommendations are proposed:

- Enhance responsiveness by improving staff speed and accuracy in addressing guest needs.
- Strengthen empathy by offering more personalized service and attentive interactions.
- Conduct regular training to develop staff professionalism and improve customer handling skills.
- Establish a continuous feedback system to monitor guest satisfaction and guide improvements.
- Improve physical aspects such as room cleanliness and comfort to support overall experience.

If these areas are addressed effectively, Sapadia Guest House has the potential to increase its CSI score beyond 85%, moving into the “very satisfied” category and building long-term customer loyalty.

## V. ACKNOWLEDGMENTS

Insert acknowledgements only in a separate section at the end of the article before the references. List here those individuals who provided help during the research.

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