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The Influence Of Service Quality Dimensions On Patient Ratings In Google Reviews Based On Text Mining (Survey Study At Hasna Medika Cirebon Hospital)

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Abstract

This study aims to examine the effect of service quality dimensions on patient ratings on Google Review using a text mining approach at Hasna Medika Hospital, Cirebon. An descriptive-verificative quantitative design was employed using secondary data derived from patients' online reviews. The analytical procedure included text preprocessing (cleaning, tokenizing, and normalization), keyword mapping into the five SERVQUAL dimensions (Reliability, Assurance, Tangibles, Empathy, and Responsiveness), and quantification of dimensional frequency as independent variables. Multiple linear regression analysis was conducted to test both simultaneous and partial effects on patient ratings as the dependent variable. The findings reveal that, simultaneously, the five service quality dimensions significantly influence patient ratings. Partially, Tangibles and Responsiveness demonstrate positive and significant effects, while Reliability and Assurance show significant negative effects. Empathy does not exhibit a significant influence. The coefficient of determination ($R^2 = 0.323$) indicates that the model explains 32.3% of the variance in patient ratings. These results suggest that digital patient reviews analyzed through text mining provide a data-driven approach for evaluating hospital service quality and offer managerial implications for strengthening patient-centered care strategies.

INTRODUCTION

Healthcare service quality is a key factor in determining patient satisfaction and loyalty, as well as an indicator of the performance of the national healthcare service system (Tjiptono & Chandra, 2024). The measurement of healthcare service quality can be done using various methods, one of which is through community satisfaction surveys (SKM), Customer Satisfaction Index (CSI), and Net Promoter Score (NPS) (Law No. 25, 2009). Despite the implementation of various programs to improve service quality, there are still complaints related to long queues, delays in medical staff attendance, doctors' competency, cleanliness, and the unfriendliness of

administrative staff (Saputra et al., 2024). On the other hand, positive reviews also emerge, showing patients' appreciation for the service quality they experience. Along with technological advancements, digital platforms like Google Reviews have become an alternative to measure patient satisfaction more quickly and in real-time (Guo et al., 2025). In this regard, Google Reviews provides an opportunity for patients to give ratings and reviews about their experiences, as internet access continues to expand, making it easier for the public to participate (Ramdhani et al., 2025).

Google.com has become one of the most visited platforms by the Indonesian public, with an average of 2.02 billion visits per month (We Are Social, 2023). This data shows Google's dominance as a primary information source for internet users in Indonesia. This shift has made Google Review an accessible, quick, and open service evaluation space. Patients can both rate and write about their experiences directly. For hospitals, digital reviews hold managerial value as they include complaints, appreciation, and real-time reputation signals. For prospective patients, digital reviews also serve as a reference before choosing a healthcare facility (Mahqfiroh & Yuliaty, 2024).

Table 1

Internet Penetration Development in Indonesia, 2018-2025.

Year	Number of Internet Connections (Million People)	Precentage
2018	171,17	64,80%
2019	196,71	73,70%
2020	196,70	73,70%
2021	210,03	77,02%
2022	215,63	77,01%
2023	215,63	78,19%
2024	221,56	79,50%
2025	229,49	80,66%

Source : APJII (2025).

The advancement of information technology has led to a paradigm shift in collecting and utilizing customer satisfaction data, including in the healthcare sector (Wijaya et al., 2023). Online platforms like Google Reviews have now become a primary alternative for measuring healthcare service quality quickly and based on real-time data. Along with digital transformation, various sectors, including medicine, nursing, and pharmacy, have undergone significant changes in how services are delivered (Guo et al., 2025). Society now has easier access to share their experiences with healthcare services through online reviews, giving patients the opportunity to rate the quality of service through stars and comments. Based on the reviews given, both the public and healthcare

providers can obtain direct information regarding patient experiences. Therefore, Google Reviews offers an efficient platform for patients to provide valuable feedback (Engle, Winter, & Schulz, 2021).

The content of reviews shared by patients can directly affect the image and trust of the public toward healthcare facilities. Reviews and ratings provided by patients through online platforms offer information that healthcare providers can use to evaluate and improve service quality. According to preliminary surveys conducted by the researcher, 97.5% of respondents stated that online reviews are important when choosing a hospital, with 83% of them seeking information through Google Reviews. These online reviews not only serve as a reference for prospective patients but also function as an important source of information for hospital management to enhance service quality. Google Reviews facilitates patients in providing feedback that can assist healthcare facilities in understanding and meeting patient expectations (Ramdhani et al., 2025). Thus, this online platform has become an effective tool in measuring healthcare service quality.

Service quality is a key factor in determining patient satisfaction and loyalty, which is closely related to quality management (Putri et al., 2023). In hospitals, service quality is the implementation of service standards aimed at improving patient health outcomes and their satisfaction with the services received. The SERVQUAL model, which consists of five main dimensions: Tangibles, Reliability, Responsiveness, Assurance, and Empathy, serves as a framework for evaluating and improving healthcare service quality (Sinollah & Masruro, 2019). These dimensions measure the gap between patient expectations and their perceptions of the service received. By applying this approach, hospitals can identify areas that need improvement to ensure patient satisfaction.

In managing patient review data, the text mining approach can be used to process and classify hundreds or thousands of reviews efficiently (Angel et al., 2023). Algorithms such as the Naïve Bayes Classifier can be used in text mining to classify text with high accuracy, enabling faster and more effective data analysis. This study aims to fill the gap in existing literature, where there has been little research classifying online reviews into SERVQUAL dimensions and analyzing their impact on patient ratings. By combining text mining techniques with the SERVQUAL model, this study is expected to provide new insights into how perceived service quality affects patient ratings through online platforms like Google Reviews. The results of this study will be useful for hospital management in evaluating and improving healthcare services based on digital data obtained in real-time and directly from the public (Ramdhani et al., 2025).

This research aims to analyze the influence of SERVQUAL dimensions (Reliability, Assurance, Tangibles, Empathy, and Responsiveness) on patient ratings in Google Reviews at Hasna Medika Cirebon Hospital. The research question raised is: How do each of the

SERVQUAL dimensions affect patient ratings in Google Reviews? The novelty of this research lies in the application of text mining techniques to classify online reviews, relate them to service quality dimensions, and analyze their impact on the ratings given by patients. This approach offers new contributions to understanding the relationship between digital reviews and healthcare service quality, as well as providing an alternative in service quality evaluation based on real-time data directly from the public. Therefore, this research is titled "The Influence of Service Quality Dimensions on Patient Ratings in Google Reviews Based on Text Mining (A Survey Study at Hasna Medika Cirebon Hospital)".

METHODS

This study uses a descriptive-verificative quantitative approach. The research object is the patient reviews on Google Reviews for Hasna Medika Cirebon Hospital. The study population consists of 400 reviews available from the time the hospital began operating in 2013 until October 31, 2025. The sample was determined through purposive sampling with the criteria of reviews containing text. Based on these criteria, 273 reviews met the requirements as the initial sample, while 127 reviews without text content were excluded from the analysis.

Data collection was conducted through web scraping from Google Reviews. The data processing steps included cleaning, tokenizing, and word normalization. Keywords in the reviews were then classified into the five SERVQUAL dimensions using the Naive Bayes classification model. The probability scores of the classification results were used as the dimension scores for the independent variables. The dependent variable, the Google Review rating on a 1 to 5 ordinal scale, was then transformed into an interval scale using the Method of Successive Interval, enabling analysis in a multiple linear regression model.

The classification model evaluation was performed using a confusion matrix and metrics such as accuracy, precision, recall, and F1-score. Inferential analysis was carried out through multiple linear regression, F-test, t-test, and the coefficient of determination (Anget et al., 2024). Before hypothesis testing, the model was examined for classical assumptions including normality, multicollinearity, and heteroscedasticity. The interpretation of the results followed the regression analysis guidelines for social and managerial data (Ghozali, 2018).

RESULTS AND DISCUSSION

Research Result

Descriptive Analysis

The study was conducted using 273 samples; however, due to the presence of one outlier in the classical assumption testing, the sample size was reduced to 272. The results of the study

show that the distribution of Google Reviews ratings is dominated by rating 5, while rating 1 ranks second. This pattern indicates that Google Review users tend to write reviews when they are either very satisfied or very dissatisfied with the hospital services.

Table 3

Distribution of Google Review Ratings for RS Hasna Medika Cirebon

Rating	Number of Reviews	Precentage
1	52	19%
2	13	5%
3	11	4%
4	28	10%
5	169	62%

Source: Processed from 273 Google Reviews.

Overall, patient reviews contain more words related to service, staff friendliness, treatment, waiting time, and queues. Lexically, patient reviews are dominated by words related to service, staff friendliness, care, time, and queues. This indicates that operational experience, service interaction, and time efficiency are the core factors patients consider when evaluating hospital services.

Table 4

Top Ten Dominant Keywords from Preprocessing Reviews

No.	Word	Token count	Doc count	Precentage
1	layan	170	146	16,01%
2	ramah	69	55	6,50%
3	jantung	68	54	6,40%
4	rawat	67	53	6,31%
5	jam	47	29	4,43%
6	bagus	40	36	3,77%
7	obat	36	26	3,39%
8	tunggu	32	24	3,01%
9	tugas	26	19	2,45%
10	antri	26	19	2,45%

Source: Processed from keyword frequency analysis.

The model classification evaluation shows that all dimensions can be mapped adequately for regression analysis. Responsiveness has the highest classification performance, while Assurance has the lowest F1-score. The average F1-score of 0.61 indicates that the model performs at a moderate level, and the probability scores from the classification results can still be used as numerical data for research.

Table 5

Classification Model Performance for SERVQUAL Dimensions

Dimension	Accuracy	Precision	Recall	F1-Score
Reliability	0,64	0,70	0,78	0,74
Assurance	0,67	0,23	0,60	0,33
Tangibles	0,83	0,80	0,44	0,57
Empathy	0,83	0,50	0,50	0,50
Responsiveness	0,92	0,89	0,94	0,91
Average	0,78	0,62	0,65	0,61

Source: Processed from confusion matrix evaluation.

Table 6

Descriptive Statistics for Research Variables

Variabel	Minimum	Maksimum	Mean	Std. deviasi
Reliability	0,0569	0,8593	0,3381	0,1988
Assurance	0,2383	0,7777	0,4875	0,0981
Tangibles	0,1302	0,8801	0,3976	0,1814
Empathy	0,1762	0,7881	0,4487	0,1253
Responsiveness	0,1728	0,9008	0,5269	0,1975
Patient Rating	1,0000	3,0415	2,4314	0,8284

Source: Processed from descriptive analysis results.

The classical assumption tests show that the regression model is suitable for use. The Kolmogorov-Smirnov test produced $p < 0.001$, but evaluation of the histogram, boxplot residuals, and normal P-P plot showed acceptable residual patterns for regression analysis. This finding is consistent with the literature stating that, for sufficiently large sample sizes, multicollinearity is not an issue as all tolerance values are above 0.10 and all VIF values are below 10. The heteroscedasticity test through scatterplot also shows a random distribution of residuals

around the zero axis, indicating that the error variance can be assumed to be constant.

Table 7

Summary of Classical Assumption Testing

Test	Key Indicators	Decision
Residual Normality	Kolmogorov-Smirnov p < 0.001; histogram and P-P plot acceptable	Suitable for use
Multicollinearity	Tolerance 0.534-0.938; VIF 1.066-1.871	No multicollinearity
Heteroscedasticity	Residual scatterplot randomly distributed	No heteroscedasticity

Source: Summarized from the classical assumption test output.

Table 8

Multiple Linear Regression Results and Partial Testing

Variable	Coefficient (B)	Sig.	Direction
Reliability	-1.205	0.001	Negative Significantly
Assurance	-1.028	0.019	Negative Significantly
Tangibles	1.058	0.001	Positive Significantly
Empathy	0.026	0.941	Not Significant
Responsiveness	1.527	0.001	Positive Significantly

Source: Processed from multiple linear regression output.

Table 9

Summary of Regression Model Feasibility

Indicator	Value
F value	26.904
Simultaneous Sig.	< 0.001
Adjusted R Square	0.323
Regression Data Count	272 reviews

Source: Processed from ANOVA output and model summary.

Verificative Analysis

The Impact of the Reliability Dimension on Patient Rating

The results of hypothesis testing H1a show that Reliability has a significant negative effect on Patient Rating. The significance value obtained is 0.001, which is less than 0.05, with a negative regression coefficient of -1.205. This indicates that the more frequently keywords related to reliability appear in patient reviews, the lower the Patient Rating score tends to be. This suggests

that patients are more likely to mention reliability when they encounter problems with the service. This finding is supported by Vuong et al. (2022), who argued that in digital healthcare services, reliability does not always have a positive impact when user expectations are very high. However, when services run smoothly, patients tend to remain silent and do not write about it in reviews. The findings are also reinforced by Chahal & Kumari in Guspianto et al. (2023), stating that in healthcare services, the reliability dimension is more sensitive and has a strong impact on evaluations. Additionally, Trenggono & Bachtiar (2025) highlight that non-compliance with schedules can decrease the perception of service quality.

The Impact of the Assurance Dimension on Patient Rating

The results of hypothesis testing H1b show that Assurance has a significant negative effect on Patient Rating. The significance value obtained is 0.019, which is less than 0.05, with a negative regression coefficient of -1.028. This negative coefficient indicates that an increase in the Assurance dimension score is followed by a decrease in the Patient Rating score. This negative impact suggests that when patients discuss safety guarantees, staff competence, or clarity of information in reviews, it reflects their concerns or doubts. The more patients feel the need to question or address the assurance aspects of the service, the more likely it is to correlate with a lower Patient Rating score. This finding is supported by Chahal & Kumari in Purwaningsih et al. (2023), who argue that assurance in healthcare does not always positively contribute to satisfaction when considered a minimum standard of service.

The Impact of the Tangibles Dimension on Patient Rating

The results of hypothesis testing H1c show that Tangibles has a significant positive effect on Patient Rating. The significance value obtained is 0.000, which is less than 0.05, with a positive regression coefficient of 1.058. This indicates that the more patients mention physical facilities in their reviews, the higher the Patient Rating score tends to be. Tangibles, such as cleanliness of the facilities and the quality of equipment, significantly influence the patient's perception of service quality. This finding is consistent with Trenggono & Bachtiar (2025), who emphasized that Tangibles like the quality of the environment, equipment, and facilities in healthcare services are crucial factors in determining hospital service quality. Kholik et al. (2022) also support this, stating that adequate facilities and equipment, as well as the appearance of healthcare staff, can contribute to optimal service delivery, which in turn positively impacts hospital service quality and patient satisfaction.

The Impact of the Empathy Dimension on Patient Rating

The results of hypothesis testing H1d show that Empathy does not have a significant effect on Patient Rating, with a significance value of 0.941, which is greater than 0.05. This indicates that the Empathy dimension is not a key factor influencing the Patient Rating in the reviews provided. As shown in the research by Pulungan et al. (2023), both Responsiveness and Empathy do not have a significant effect on patient satisfaction. Furthermore, research by Syakila et.al (2023) indicates that Reliability and Tangibles do not significantly affect patient satisfaction. In this study, empathy, which is related to individual attention and care for patients, did not play a determining role in shaping the rating patients provided. This may be due to brief or system-oriented service interactions where patients may not experience empathy directly.

The Impact of the Responsiveness Dimension on Patient Rating

The results of hypothesis testing H1e show that Responsiveness has a significant positive effect on Patient Rating. The regression coefficient is 1.527, and the significance value is 0.001, indicating that the faster and more responsive the staff are in serving patients, the higher the Patient Rating score tends to be. Fast service is seen as a form of respect for the patient's time and is a critical factor in their satisfaction. This finding is consistent with Setianingsih & Susanti (2021), who found that responsiveness significantly influences patient satisfaction. The responsiveness of healthcare staff in addressing patient complaints, quickly assisting with service, and fulfilling patient needs directly impacts patient satisfaction and, consequently, the rating they provide.

The Simultaneous Impact of Reliability, Assurance, Tangibles, Empathy, and Responsiveness Dimensions on Patient Rating

The results of hypothesis H1 show that the five service quality dimensions—Reliability, Assurance, Tangibles, Empathy, and Responsiveness—together have a significant impact on Patient Rating. The F-test significance value shows that these dimensions explain 32.3% of the variation in Patient Rating, while the remaining 67.7% is influenced by factors outside the model. This is consistent with the findings of Setianingsih & Susanti (2021), who showed that all quality service indicators in healthcare significantly influence patient satisfaction. Additionally, the research by Septiani et al. (2020) confirms that the combined effect of Reliability, Assurance, Responsiveness, Tangibles, and Empathy on patient satisfaction is significant. Overall, these five dimensions play an important role in shaping patients' perceptions of the quality of services they receive.

CONCLUSION

The results of the study indicate that the Reliability and Assurance dimensions have a negative effect on patient ratings, while the Responsiveness and Tangibles dimensions have a positive effect. The Empathy dimension, however, does not have a significant impact on patient ratings. This suggests that patient perceptions, influenced by both technical service quality factors and emotional expectations, play a significant role in the online reviews provided. The study also emphasizes the effective use of text mining techniques and the Naive Bayes algorithm in analyzing patient reviews, although the reliability of the model still requires improvement.

In this study, it is recommended that hospitals focus on enhancing the Tangibles and Responsiveness dimensions by improving physical facilities, cleanliness, and speeding up service times. Additionally, to improve Reliability and Assurance, management should evaluate the consistency of service procedures and ensure clear communication regarding medical staff competence. While the Empathy dimension did not show a significant impact, improving interpersonal communication training and adopting a patient-centered care approach should still be considered to enhance patient satisfaction. For future research, it is suggested to use alternative classification models, such as Support Vector Machine (SVM), and combine secondary data with primary data such as SERVQUAL questionnaires to improve the validity of results. Research involving multiple online review platforms would also broaden the generalizability of the study's findings. Limitations of this study include the reliance on voluntary Google Reviews and cross-sectional data, making further research with longitudinal data recommended.

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