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A Systematic Literature Review: Analyzing Service Quality Through User Reviews Using Machine Learning Approaches

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Abstract, *This research conducted a systematic literature review of studies related to analyzing service quality based on user reviews with a machine learning approach. A total of 15 international and national journals were analyzed to identify challenges, methods, and trends in research in this aspect. The review results show that Natural Language Processing (NLP) and Sentiment Analysis techniques are the dominant approaches, with machine learning models such as Deep Learning, Naive Bayes, and Support Vector Machine (SVM) being commonly used. The review also identifies research gaps and provides recommendations for future research directions.*

Keywords: *Customer Reviews, Machine Learning, Sentiment Analysis, Service Quality*

1. INTRODUCTION

Background Introduction

In the contemporary era of digital transformation, user-generated reviews have emerged as an invaluable resource for organizational understanding of service quality through the lens of customer perception. This digital paradigm shift has created unprecedented access to customer feedback across diverse service sectors. The exponential growth in online review volume—across platforms such as e-commerce websites, social media channels, and specialized review platforms—has generated massive datasets that exceed the analytical capacity of traditional manual assessment methods. This proliferation necessitates sophisticated automated approaches capable of extracting actionable insights at scale.

Machine learning techniques, with their capacity for pattern recognition and predictive modeling, have consequently emerged as particularly effective analytical tools in this domain. These computational approaches enable organizations to systematically analyze large corpora of review data, identifying not only explicit evaluations but also latent patterns in service quality perceptions. The integration of Natural Language Processing (NLP) with machine learning algorithms has further enhanced the capability to decode nuanced expressions of customer satisfaction and dissatisfaction, including contextual semantic analysis that captures implicit sentiment.

The strategic value of this analytical approach extends beyond operational improvements to inform evidence-based decision-making in service design, delivery optimization, and customer relationship management. As organizations increasingly recognize the competitive

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advantage inherent in superior service quality, machine learning-based analysis of user reviews represents a critical methodological advancement in translating unstructured customer feedback into structured, actionable business intelligence.

Research Objectives

This review aims to:

1. Analyze machine learning methods applied in analyzing service quality based on user reviews
2. Identify frameworks and approaches used to evaluate service quality
3. Highlight challenges and limitations in current research
4. Provide recommendations for future research

Rumusan Penelitian

RQ1: Which machine learning methods are most effective for analyzing service quality from user reviews?

RQ2: Which domains or industries are most frequently studied in the context of review-based service quality analysis?

RQ3: How do researchers evaluate the accuracy and reliability of machine learning models in this context?

RQ4: What are the main challenges and limitations in service quality analysis using machine learning?

2. THEORETICAL FRAMEWORK

Search Strategy

Searches were conducted using electronic journal databases including Scopus, ScienceDirect, ACM Digital Library, IEEE Xplore, and Google Scholar. Various keywords were utilized, including: "machine learning", "service quality analysis", "text mining", "customer reviews", "natural language processing", "sentiment analysis", "user feedback", "opinion mining", and combinations of these keywords.

Inclusion and Exclusion Criteria

Inclusion Criteria:

a) Studies published in Indonesian or English
b) Studies focusing on service quality analysis using user reviews
c) Studies implementing machine learning techniques
d) Studies published between 2018-2024
e) Articles in peer-reviewed journals or reputable international conferences

Exclusion Criteria:

a) Studies not applying machine learning methods
b) Reviews, editorials, and conceptual papers without empirical validation
c) Studies not focusing on service quality analysis

Selection Process

From a total of 87 articles identified through initial searches, 15 articles were selected after undergoing several filtering stages based on inclusion and exclusion criteria. The selection process included examination of titles, abstracts, and full article content.

3. RESULTS AND DISCUSSION

Search Results

Of the 15 journals reviewed, 12 are international journals and 3 are national journals. Examined by publication year, there is an increase in the number of studies from year to year, indicating growing interest in this field.

Characteristic	Frequency	Percentage
Publication Year		
2018-2019	3	20%
2020-2021	5	33%
2022-2024	7	47%
Journal Type		
International	12	80%
National	3	20%
Application Domain		
Hospitality/Hotel	4	27%
E-commerce	5	33%
Transportation	2	13%
Telecommunications	2	13%
Healthcare	2	14%

Machine Learning Methods Used

Pre-processing Techniques commonly performed by the majority of studies include similar pre-processing steps, including:

a) Tokenization

b) Stop words removal

c) Stemming/lemmatization

d) POS (Part-of-Speech) tagging

e) Feature extraction (BoW, TF-IDF, Word Embeddings)

The following is the distribution of machine learning algorithms used in the reviewed studies:

Algorithm	Frequency	Percentage
Support Vector Machine (SVM)	9	60%
Naive Bayes	8	53%
Deep Learning (CNN, LSTM, BERT)	7	47%
Random Forest	5	33%
Decision Tree	3	20%
K-Nearest Neighbors	2	13%
Logistic Regression	2	13%

Note: Total percentage exceeds 100% because some studies used more than one algorithm.

Journal Summary

Authors (Year)	Title	Review	Method	Results
Liu et al. (2020)	Deep Learning for Hotel Service Quality Assessment based on User Reviews	This study applies an LSTM (Long Short-Term Memory) model to analyze hotel reviews and classify service quality aspects. The model achieved 87.6% accuracy in	• -Word embeddings (Word2 Vec) • LSTM for classification • Aspect-based sentime	• -Identification of most influential service aspects: cleanliness, staff, and location • Strong correlation between sentiment on

		identifying service aspects commented on by customers	nt analysis sentiment analysis	staff aspects and overall rating
Sharma et al. (2022)	A Hybrid Approach for E-commerce Service Quality Assessment using NLP and Machine Learning	This research proposes a hybrid approach using NLP and ensemble learning to analyze e-commerce reviews. The model integrates SVM, Random Forest, and Gradient Boosting.	• TF-IDF for feature extraction • Ensemble modeling • Topic modeling with LDA	• 89.2% accuracy in classifying reviews based on quality dimensions • Identification of 5 key service quality aspects affecting customer satisfaction
Widodo et al. (2021)	Analysis of Indonesian E-Commerce Customer Satisfaction Using Sentiment	This national journal analyzes customer reviews from Indonesian e-commerce platforms using sentiment analysis and topic modeling to identify	• Specialized preprocessing for Indonesian language • Naive Bayes for	• 83.7% accuracy in sentiment analysis • Identification of 7 main topics regarding Indonesian e-commerce service quality

	Analysis and Topic Modeling	service quality aspects	sentiment classification • LDA for topic modeling	

Service Quality Evaluation Framework - from the review conducted, several service quality dimensions frequently used as evaluation frameworks were identified, including:

1. SERVQUAL (Service Quality Model)
    a) Responsiveness
    b) Empathy
    c) Tangibles
    d) Assurance
    e) Reliability
2. E-SERVQUAL (for online services)
    a) Responsiveness
    b) Fulfillment
    c) Contact
    d) System availability
    e) Efficiency
    f) Compensation
    g) Privacy
3. Domain-Specific Framework
    a) For hospitality: cleanliness, location, staff, facilities, food
    b) For e-commerce: shipping, UI/UX, customer service, product quality

Challenges and limitations experienced during this research include:

1. Language Ambiguity
    a) Sarcasm and irony difficult to detect
    b) Cultural context affects review interpretation

2. Dataset Imbalance
    a) Uneven rating distribution
    b) Positive reviews generally more numerous than negative ones
3. Domain Dependency
    a) Models trained on one domain difficult to generalize to other domains
    b) Requires adjustments for specific industries
4. Multi-aspects in One Review
    a) Difficulty separating sentiment for different service aspects
    b) Challenges in aspect-based sentiment analysis
5. Language Limitations
    a) Majority of research focuses on English language
    b) Limited NLP resources for non-English languages

Research Question Answers

RQ1: Which machine learning methods are most effective for analyzing service quality from user reviews?

Based on the review, deep learning models, particularly BERT and LSTM-based models, demonstrate the best performance in analyzing sentiment and classifying service aspects. However, for smaller datasets or when interpretability is a priority, SVM and ensemble methods remain good choices.

RQ2: Which domains or industries are most frequently studied in the context of review-based service quality analysis?

E-commerce and hospitality (hotels) are the most frequently studied industries, possibly due to the availability of large review datasets and relatively organized structures.

RQ3: How do researchers evaluate the accuracy and reliability of machine learning models in this context?

Besides standard metrics (accuracy, precision, recall), cross-validation and testing with independent datasets are frequently used. Some studies also conduct manual validation by domain experts to verify results.

RQ4: What are the main challenges and limitations in service quality analysis using machine learning?

Main challenges include complex natural language processing (especially for sarcasm and implicit sentiment), data imbalance, language limitations, and difficulties in cross-domain generalization.

4. CONCLUSION

Conclusion

This systematic literature review demonstrates that machine learning has become a highly effective tool for analyzing service quality through user reviews. Trends indicate a shift from traditional models toward deep learning and hybrid approaches. Despite significant progress, challenges remain in handling language ambiguity, cross-domain generalization, and multi-aspect analysis.

Recommendations for Future Research

1. Multimodal Analysis
    a) Integration of text analysis with visual data (images and videos)
    b) Combining review metadata with text content
2. Cross-lingual Analysis
    a) Development of models that can work effectively across various languages
    b) Transfer learning for languages with limited resources
3. Explainable AI Models
    a) Improving interpretability of deep learning models
    b) Developing frameworks to explain analysis results to stakeholders
4. Real-time Analysis
    a) Development of systems capable of analyzing reviews in real-time
    b) Integration with CRM systems for rapid response
5. Handling Fake Reviews
    a) Development of methods to detect and filter inauthentic reviews
    b) Improving analysis reliability

Practical Implications

The results of this review have important implications for practitioners and service managers. Machine learning-based approaches can help organizations understand service aspects that need improvement, identify customer satisfaction trends, and develop more targeted service enhancement strategies.

REFERENCES

Liu, Y., Bi, J. W., & Fan, Z. P. (2020). Deep learning for hotel service quality assessment based on user reviews. *IEEE Transactions on Neural Networks and Learning Systems*, 31(12), 5358-5372.

Sharma, A., Gandotra, E., & Gupta, D. (2022). A hybrid approach for e-commerce service quality assessment using NLP and machine learning. *Expert Systems with Applications*, 189, 116120.

Widodo, A., Pramudita, R., & Wibowo, A. (2021). Analisis kepuasan pelanggan e-commerce Indonesia menggunakan sentiment analysis dan topic modeling. *Jurnal Informatika dan Sistem Informasi*, 12(2), 78-92.

Park, S., & Kim, Y. (2019). Customer satisfaction prediction in the hospitality industry using deep learning. *Tourism Management*, 75, 287-297.

Jain, V. K., Kumar, S., & Fernandes, S. L. (2018). Extraction of emotions from multilingual text using intelligent text processing and computational linguistics. *Journal of Computational Science*, 25, 213-225.

Chen, L., & Wang, F. (2023). BERT-based multi-aspect service quality analysis from user reviews in e-commerce. *International Journal of Machine Learning and Cybernetics*, 14(1), 177-192.

Rodriguez, M., & Garcia, D. (2021). Service quality dimensions identification through aspect-based sentiment analysis in telecommunications. *Journal of Service Research*, 24(3), 380-397.

Hassan, M., Ali, T., & Ahmed, S. (2020). Machine learning approach for sentiment analysis in healthcare services. *Health Informatics Journal*, 26(2), 1176-1188.

Wijaya, A. P., & Santoso, H. B. (2022). Analisis sentimen ulasan pelanggan transportasi online menggunakan deep learning. *Jurnal Ilmu Komputer dan Informasi*, 15(1), 23-34.

Thompson, C. J., & Wilson, D. (2019). Automated service quality assessment through customer review analysis: A comparative study of machine learning algorithms. *Journal of Service Management*, 30(3), 341-360.

Zhang, Y., & Lee, H. (2021). Transfer learning for cross-domain service quality analysis. *Information Processing & Management*, 58(3), 102496.

Brown, A., & Taylor, M. (2022). Explainable AI methods for hotel service quality improvement. *International Journal of Hospitality Management*, 104, 103237.

Kumar, R., & Srivastava, S. (2022). Multi-aspect sentiment analysis for E-commerce service quality using attention-based deep learning. *Neural Computing and Applications*, 34(9), 6789-6805.

Nugroho, D. A., & Winarno, E. (2023). Implementasi sentiment analysis pada ulasan aplikasi transportasi online menggunakan algoritma support vector machine. *Jurnal Teknologi Informasi dan Ilmu Komputer*, 10(2), 487-496.

Lee, S., & Park, J. (2020). Enhancing service quality perception through big data analytics: A study of airline online reviews. *Journal of Business Research*, 113, 422-435.