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Restaurant Review Analysis System

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ABSTRACT: The increasing reliance on digital platforms in the hospitality industry has led to a substantial growth in customer-generated restaurant reviews. While such feedback provides valuable insight into service quality and customer satisfaction, manual interpretation is inefficient and lacks systematic organization. This paper presents a web-based Restaurant Review Analysis System designed to automate review collection, implement structured sentiment classification, and provide analytical visualization for managerial decision-making. The system employs a deterministic rule-based rating threshold method to categorize reviews into positive, neutral, and negative sentiments. A three-tier architecture consisting of presentation, application, and database layers is implemented using HTML, CSS, JavaScript, Node.js, Express.js, MongoDB, and Chart.js. The system generates graphical outputs including sentiment distribution charts, monthly trend analysis, and food performance rankings. Experimental evaluation demonstrates stable performance, efficient data handling, and real-time visualization capabilities. The proposed solution offers a cost-effective and scalable review management framework suitable for small and medium-scale restaurant enterprises.

KEYWORDS: Restaurant Review Analysis System, Rule-Based Sentiment Classification, Customer Feedback Analytics, Web Dashboard, MongoDB, Node.js, Data Visualization.

I. INTRODUCTION

Customer feedback has become a critical factor in determining the success and sustainability of restaurants in the digital era. Online reviews significantly influence customer decisions, brand perception, and competitive positioning. As the number of reviews increases, restaurant owners face challenges in systematically analyzing and extracting actionable insights from large volumes of feedback data.

Manual review monitoring is time-consuming and often lacks structured interpretation. Without organized analytics, management decisions are based on subjective observations rather than data-driven evidence. Automated review analysis systems address these challenges by collecting, classifying, and visualizing customer feedback in a structured format.

This research proposes a Restaurant Review Analysis System that automates sentiment classification using predefined rating thresholds and provides an interactive dashboard for analysis. The system focuses on simplicity, computational efficiency, and ease of deployment while maintaining analytical reliability. Unlike predictive modeling approaches, the framework relies on deterministic rules to ensure transparency and consistent performance.

II. LITERATURE REVIEW

Sentiment analysis, commonly referred to as opinion mining, has been widely studied in information retrieval and data analytics research. Pang and Lee [1] introduced early techniques for classifying textual polarity in online reviews. Liu [2] further expanded opinion mining frameworks by focusing on extracting structured sentiment from unstructured text data.

Hu and Liu [3] explored methods for mining and summarizing customer reviews to identify product performance indicators. Various modern systems integrate machine learning and deep learning techniques to enhance semantic



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interpretation accuracy. However, such approaches require extensive training datasets, model optimization, and computational resources.

For business environments with limited infrastructure, rule-based sentiment classification presents a practical alternative. Numeric rating thresholds provide a direct and interpretable mechanism for categorization when structured feedback is available. Several web-based review management systems combine rating-based logic with dashboard analytics to support managerial decision-making.

The present study adopts a deterministic classification methodology to ensure computational efficiency, reliability, and simplified deployment while maintaining meaningful analytical insight.

III. PROBLEM STATEMENT

With the rapid growth of online platforms, restaurants receive a large volume of customer reviews daily. Although this feedback contains valuable insights regarding food quality, service standards, and customer satisfaction, many restaurants lack a structured system to analyze and interpret such data efficiently. Manual review monitoring is time-consuming, inconsistent, and does not provide measurable performance indicators. Furthermore, existing advanced analytical solutions often require complex implementation and high computational resources, making them unsuitable for small and medium-scale establishments. Therefore, there is a need for a simple, automated, and cost-effective review analysis system capable of performing sentiment classification, data aggregation, and graphical visualization in real time to support informed managerial decision-making.

IV. SYSTEM ARCHITECTURE

The proposed system is structured using a three-tier architectural model to ensure modularity and scalability.

A. Presentation Layer

The presentation layer manages user interaction and interface rendering. Developed using HTML, CSS, Bootstrap, and JavaScript.

It provides:

- Interactive food menu display
- Customer review submission form
- Owner authentication interface
- Analytical dashboard visualization

RESTful API communication ensures asynchronous interaction with backend services.

B. Application Layer

The application layer is implemented using Node.js and Express.js.

It performs:

- HTTP request processing
- Data validation and sanitization
- Rule-based sentiment classification
- Owner reply management
- Review aggregation and statistical computation

This layer acts as a bridge between the frontend interface and database.

C. Data Layer

MongoDB is used as a NoSQL document-oriented database.

Each review record contains:

- Customer name
- Food item
- Numeric rating
- Review comments
- Sentiment classification
- Timestamp



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- Owner reply

The flexible schema structure allows efficient data storage and retrieval.

V. SYSTEM OVERVIEW

The system workflow begins when a customer submits a review through the web interface. The backend validates input data and applies a predefined sentiment classification rule:

- Rating $\geq 4 \rightarrow$ Positive
- Rating = 3 \rightarrow Neutral
- Rating $\leq 2 \rightarrow$ Negative

The classified review is stored in MongoDB. The owner dashboard retrieves aggregated data and displays:

- Sentiment proportion pie chart
- Monthly review trend line chart
- Food performance ranking table
- Owner reply interface

Chart.js is used to generate dynamic visual representations, enabling intuitive interpretation of feedback data.

VI. RESULTS AND OUTCOMES

System testing was conducted using simulated datasets with incremental review submissions.

Observations indicate:

- Immediate sentiment categorization upon review submission
- Stable database insertion and retrieval performance
- Efficient aggregation of monthly statistics
- Responsive graphical rendering across various data volumes

The analytical dashboard successfully highlights customer satisfaction levels, seasonal trends, and low-performing food items. The owner reply mechanism enhances transparency and customer engagement.



Fig 1.Home Page Interface of the Restaurant Review Analysis System.

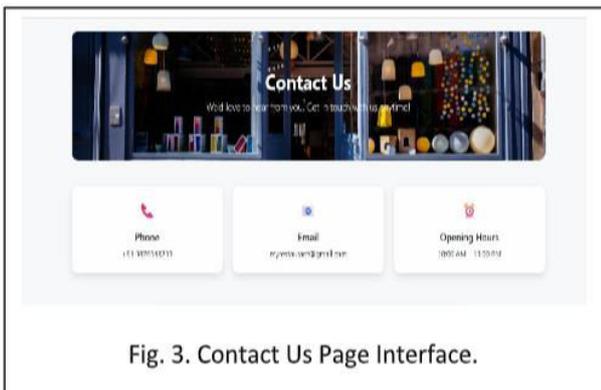
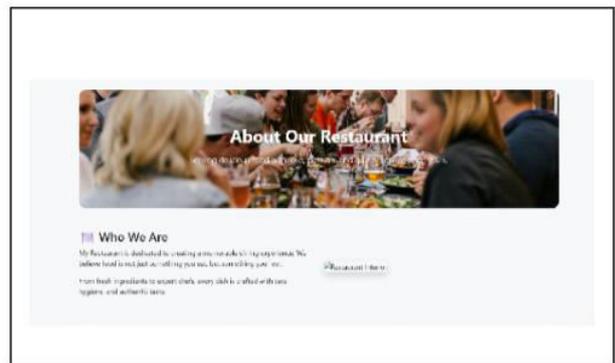


Fig. 3. Contact Us Page Interface.

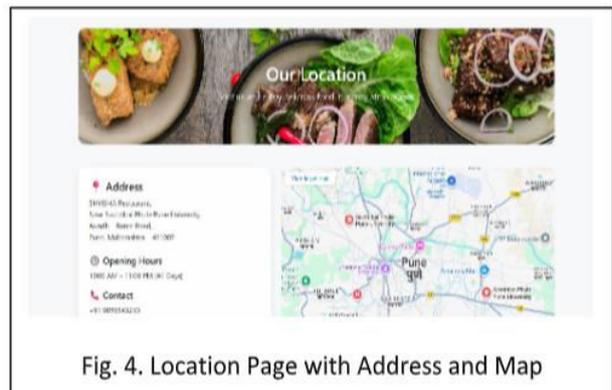


Fig. 4. Location Page with Address and Map



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Fig. 5. QR Code-Based Menu Access Interface.



Fig. 6. Food Menu with Review Submission Option.

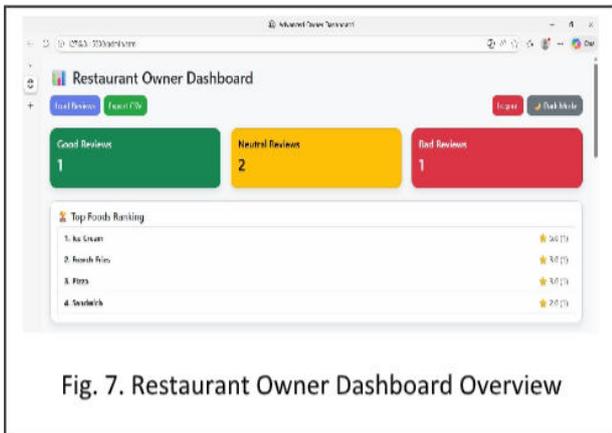


Fig. 7. Restaurant Owner Dashboard Overview



Fig. 8. Food Performance Analysis Table Displaying Average Ratings.

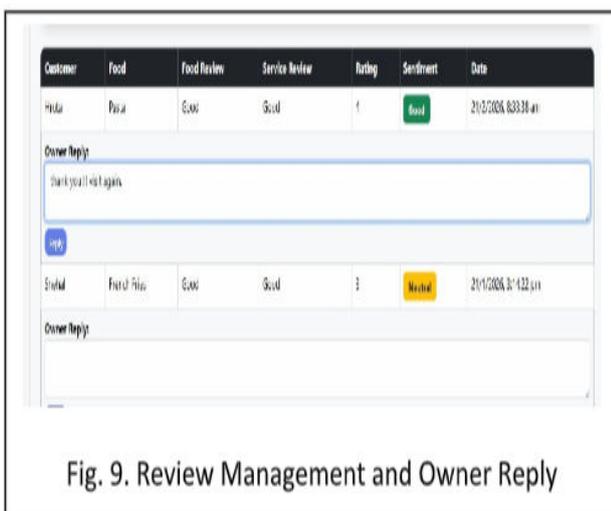


Fig. 9. Review Management and Owner Reply



Fig. 10. Customer Review Submission Form with Rating Selection.



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VII. ADVANTAGES & DISADVANTAGES

Advantages:

1. Efficient Sentiment Classification

The rule-based rating threshold approach ensures fast and consistent sentiment categorization without requiring complex computational resources.

2. Real-Time Data Visualization

The integration of interactive dashboard components enables graphical representation of sentiment distribution and review trends, supporting quick managerial analysis.

3. Structured Data Management

The use of MongoDB allows organized storage of review records, enabling efficient retrieval, filtering, and aggregation of customer feedback data.

4. Modular and Scalable Architecture

The three-tier architectural design separates presentation, application, and data layers, allowing easy maintenance and future expansion of system features.

VIII. LIMITATIONS

1. Dependence on Numeric Ratings

Sentiment classification is based solely on predefined rating thresholds, which may not fully capture the detailed opinion expressed in textual comments.

2. Limited Textual Interpretation

The system does not analyze linguistic features or contextual nuances in review comments.

3. Descriptive Analytics Only

The framework focuses on summarizing and visualizing existing data rather than performing predictive or advanced analytical modeling.

4. Scalability for Large Enterprises

While suitable for small and medium-scale restaurants, large-scale deployment may require additional infrastructure and optimization.

IX. CONCLUSION AND FUTURE SCOPE

This paper presented a web-based Restaurant Review Analysis System designed to automate customer feedback management and provide structured analytical insights. The system successfully integrates rule-based sentiment classification with interactive dashboard visualization to support data-driven decision-making. Implementation results demonstrate stable performance, efficient data handling, and real-time graphical representation of customer satisfaction trends. The framework offers a practical and cost-effective solution suitable for small and medium-scale restaurant enterprises.

In future developments, advanced Natural Language Processing techniques may be incorporated to analyze textual review content in greater depth. Additionally, cloud-based deployment and mobile application integration may enhance scalability and accessibility. These enhancements can further strengthen the analytical capability of the proposed system while maintaining its modular architecture.

REFERENCES

- [1] B. Pang and L. Lee, "Opinion mining and sentiment analysis," *Foundations and Trends in Information Retrieval*, vol. 2, no. 1–2, pp. 1–135, 2008, doi: 10.1561/1500000011.
- [2] B. Liu, *Sentiment Analysis and Opinion Mining*. San Rafael, CA, USA: Morgan & Claypool Publishers, 2012.



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- [3] M. Hu and B. Liu, "Mining and summarizing customer reviews," in Proc. 10th ACM SIGKDD Int. Conf. Knowledge Discovery and Data Mining (KDD '04), Seattle, WA, USA, 2004, pp. 168–177.
- [4] R. S. Pressman and B. R. Maxim, Software Engineering: A Practitioner's Approach, 8th ed. New York, NY, USA: McGraw-Hill Education, 2015.
- [5] I. Sommerville, Software Engineering, 10th ed. Boston, MA, USA: Pearson Education, 2016.
- [6] MongoDB Inc., "MongoDB Manual," 2026. [Online]. Available: <https://www.mongodb.com/docs/>. [Accessed: Jan. 2026].
- [7] OpenJS Foundation, "Node.js Documentation," 2026. [Online]. Available: <https://nodejs.org/en/docs/>. [Accessed: Jan. 2026].
- [8] Chart.js Contributors, "Chart.js Documentation," 2026. [Online]. Available: <https://www.chartjs.org/docs/latest/>. [Accessed: Jan. 2026].



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