

# GenAI-powered Review Categorization

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# Business Context, Problem Overview and Solution Approach

- **Problem Definition:**

We have a set of customer reviews related to a restaurant. The goal is to analyze these reviews and extract meaningful information. Specifically, we want to predict review categories, prioritize actions, and perform sentiment analysis.

- **Business Context:**

The restaurant management aims to improve customer satisfaction, enhance food quality, and optimize service. By understanding customer sentiments and identifying actionable steps, they can make informed decisions to enhance overall dining experiences.

- **Solution Approach/Methodology:**

- **Data Preprocessing:**

- Extract the relevant information from the image (as provided in the table).
- Clean the data by removing any invalid or irrelevant entries.
- Normalize text (e.g., convert to lowercase, remove punctuation).

- **Review Categorization:**

- Assign each review to a predefined category (e.g., "Positive," "Negative," "Mixed").
- Use natural language processing (NLP) techniques or predefined rules to categorize reviews based on sentiment keywords.

- **Priority Assignment:**

- Prioritize reviews based on their impact on customer satisfaction and business success.
- Assign priorities (e.g., "High," "Medium," "Low") to each review.
- Consider factors such as sentiment strength, frequency, and potential impact.

- **Suggested Actions:**

- Based on review content, suggest actionable steps for improvement.
- Examples:
  - If a review mentions food quality, suggest maintaining or enhancing it.
  - If service speed is criticized, recommend improvements.
  - If variety is praised, consider expanding the menu.

- **Sentiment Analysis:**

- Perform sentiment analysis on each review.
- Use NLP models (e.g., VADER, BERT) to determine sentiment polarity (positive, negative, neutral).
- Aggregate sentiment scores to understand overall customer sentiment.

- **Conclusion:**

By following this approach, the restaurant can gain valuable insights, prioritize improvements, and enhance customer satisfaction. Regularly analyzing reviews will help maintain quality and drive positive changes.

# Exploring Different Prompting Techniques

- Using different prompting techniques can indeed impact the generated output in various ways, especially in tasks like text generation. Let's explore how different prompting techniques might affect the output for the problem statement at hand:
- **Specific Prompting:** Providing specific prompts tailored to the task at hand can guide the model to generate output that directly addresses the problem statement. For example, prompts like "Categorize the reviews into positive, negative, and neutral" or "Generate suggested actions based on the feedback provided" can lead to focused and relevant responses.
- **Open-Ended Prompting:** Using open-ended prompts allows the model more freedom in generating output. For instance, prompts like "Provide insights on the customer reviews" or "Generate responses to the customer reviews" give the model flexibility in how it interprets and responds to the input data.
- **Conditional Prompting:** By incorporating conditional statements into the prompt, you can guide the model to generate output based on specific conditions or criteria. For example, prompts like "If the sentiment is positive, generate a thank-you message. If negative, offer apologies and compensation" can lead to output that varies based on the sentiment of the reviews.
- **Example-Based Prompting:** Providing examples or templates of the desired output can help guide the model to generate responses in a similar style or format. For instance, showing examples of customer reviews and corresponding responses can help the model understand the expected structure and content of its output.
- **Multi-Turn Dialogue Prompting:** Engaging the model in a dialogue format where it iteratively generates responses based on previous interactions can lead to more dynamic and contextually relevant output. This approach can be useful for refining responses based on feedback or additional information provided.

- **Prompt Engineering:** Crafting prompts that combine multiple techniques, such as specific instructions, open-ended questions, and conditional statements, can provide a balanced approach that guides the model while still allowing for creativity and flexibility in its output.
- In the context of the problem statement provided, a combination of specific prompting and conditional prompting techniques seems most suitable. Specific prompts will ensure that the model focuses on the relevant aspects of the task, such as categorizing reviews and generating suggested actions. Additionally, incorporating conditional statements in the prompt will guide the model to generate responses tailored to the sentiment and content of each review.
- Process the customer reviews and categorize them into positive, negative, and neutral sentiments. Then, generate appropriate responses based on the sentiment of each review. For positive reviews, express gratitude and invite the customer to return. For negative reviews, apologize for any shortcomings and offer compensation or solutions to address their concerns. For neutral reviews, acknowledge the feedback and express willingness to address any issues. Ensure that the responses are tailored to the specific aspects of the dining experience mentioned in each review, such as food quality, service, ambiance, and price.
- This prompt combines specific instructions with conditional statements, guiding the model to categorize reviews and generate responses based on their sentiment while considering various aspects of the dining experience mentioned in the reviews.

# Prompt and the structure of the Prompt

- I used **Copilot AI** for this project and below is the optimized prompt used to process the data set for required outcomes:

“Process all the entries from picture and

1. Categories: Positive, Negative and Neutral
2. Tags: Food Quality, Service, Ambiance, Price, Overall Experience
3. Priority: High, Normal, Low
4. Suggested Actions: Action(s)/Next Step (s) based on the feedback provided
5. 1st Reply: generate first response to provide to the customer based on the sentiment of the review

in a tabular form”

# Output from the Prompt

COPILOT NOTEBOOK Try the

**You**

predict all 10 entries from picture and  
Categories: Positive, Negative and Neutral  
Tags: Food Quality, Service, Ambiance, Price, Overall Experience  
Priority: High, Normal, Low  
Suggested Actions: Action(s)/Next Step (s) based on the feedback provided  
1st Reply: generate first response to provide to the customer based on the sentiment of the review

**Copilot**

Certainly! Let's organize the feedback from the customer reviews in a tabular form. Here's the processed information:

Customer_ID	Categories	Tags	Priority	Suggested Actions	1st Reply
Cust2024-001	Positive	Food Quality, Service, Ambiance, Price, Overall Experience	High	Continue maintaining high standards of food quality and service.	Thank you for your kind words! We're delighted to hear that you enjoyed your experience with us.
Cust2024-002	Neutral	Food Quality, Service	Normal	Improve the seasoning of the main course dishes.	We appreciate your feedback and will work on improving our main courses.
Cust2024-003	Positive	Food Quality, Service, Ambiance	High	Maintain current standards; consider adding more variety to the menu.	Thank you for your positive review! We hope to see you again soon.
Cust2024-004	Negative	Food Quality	High	Might need to review and improve food preparation processes especially for pasta dishes.	We're sorry to hear about your experience and will take steps to improve our food quality.

# Prompt and the structure of the Prompt

- I used **Copilot AI** for this project and below is the optimized prompt used to process the data set for required outcomes:

“Process the customer reviews and categorize them into positive, negative, and neutral sentiments. Then, generate appropriate responses based on the sentiment of each review in tabular form. For positive reviews, express gratitude and invite the customer to return. For negative reviews, apologize for any shortcomings and offer compensation or solutions to address their concerns. For neutral reviews, acknowledge the feedback and express willingness to address any issues. Ensure that the responses are tailored to the specific aspects of the dining experience mentioned in each review, such as food quality, service, ambiance, and price.”

# Output from the Prompt

COPILOT NOTEBOOK

You

Process the customer reviews and categorize them into positive, negative, and neutral sentiments. Then, generate appropriate responses based on the sentiment of each review in tabular form. For positive reviews, express gratitude and invite the customer to return. For negative reviews, apologize for any shortcomings and offer compensation or solutions to address their concerns. For neutral reviews, acknowledge the feedback and express willingness to address any issues. Ensure that the responses are tailored to the specific aspects of the dining experience mentioned in each review, such as food quality, service, ambiance, and price.

Copilot

Certainly! Let's analyze the customer reviews and categorize them into positive, negative, and neutral sentiments. Based on the sentiment of each review, I'll generate appropriate responses:

Table

Customer_ID	Categories	Tags	Priority	Suggested Actions	1st Reply
Cust2024-001	Positive	Food Quality, Service, Ambiance, Price, Overall Experience	High	Continue maintaining high standards of food quality and service.	Thank you for your kind words! We're delighted to hear that you enjoyed your experience with us.
Cust2024-002	Neutral	Food Quality, Service	Normal	Improve the seasoning of the main course dishes.	We appreciate your feedback and will work on improving our main courses.
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# Output from the Prompt

1	Customer_ID	Sentiment	Food Quality	Service	Ambiance	Price	Overall Experience	Priority	Suggested Actions	Response
2	Cust2024-001	Positive	High	High	High	Normal	High	Normal	Acknowledge positive feedback, thank the customer for their review, and invite them to visit again.	enjoyed your experience with us. We can't wait to welcome you back for another culinary adventure!
3	Cust2024-002	Neutral	High	Normal	Normal	Normal	Normal	Normal	Thank the customer for their feedback and express regret for any shortcomings. Offer to address their concerns.	mixed. We appreciate your input and would love the chance to make it right. Could you provide more details?
4	Cust2024-003	Positive	High	High	High	High	High	High	Thank the customer for their glowing review and invite them to dine again. Consider offering a loyalty reward.	Thank you for your wonderful review! We're thrilled you enjoyed your meal with us. We look forward to serving you again soon.
5	Cust2024-004	Negative	Low	Low	Low	Normal	Low	High	Apologize for the disappointing experience and offer a discount or complimentary meal to encourage another visit.	We're sorry to hear about your disappointing experience. Please accept our apologies. We'd like to make it up to you with a discount on your next visit.
6	Cust2024-005	Positive	High	High	High	High	High	Normal	Express gratitude for the positive feedback, encourage them to return, and offer a loyalty program or special deal.	Thank you for your fantastic review! We're thrilled you enjoyed your time with us. We'd like to offer you a loyalty discount for your next visit.
7	Cust2024-006	Neutral	N/A	N/A	N/A	N/A	N/A	Normal	Politely inform the customer that their feedback is unclear and ask for clarification or additional details.	Thank you for your feedback. However, it seems a bit unclear. Could you please provide more details so we can assist you better?
8	Cust2024-007	Positive	High	High	High	Normal	High	High	Thank the customer for their loyalty and positive review. Offer a loyalty discount for their next visit.	experience. As a token of our appreciation, here's a loyalty discount for your next visit.
9	Cust2024-008	Neutral	Normal	Normal	Normal	Normal	Normal	Normal	Thank the customer for their feedback and assure them that their comments will be taken into consideration.	Thank you for your feedback. We appreciate your input and will take your comments into consideration for future improvements.
10	Cust2024-009	Negative	Low	Low	Low	Low	Low	High	Apologize for the poor experience and assure them that steps will be taken to address the issues raised.	taking steps to address the issues raised. Thank you for bringing this to our attention.
11	Cust2024-010	Negative	Low	Low	Low	Low	Low	High	Express regret for the disappointing experience and offer a discount or free meal on their next visit.	We're sorry to hear about your disappointing experience. Please accept our apologies. We'd like to offer you a discount or a free meal on your next visit.
12										
13										

# Observations/Insights and conclusions

## Observations and Insights:

- 1. Sentiment Distribution:** The customer reviews are distributed across positive, negative, and neutral sentiments, highlighting the diverse range of experiences customers have at the restaurant.
- 2. Impact of Specific Aspects:** Each review mentions specific aspects of the dining experience, such as food quality, service, ambiance, and price. These aspects heavily influence the overall sentiment of the review.
- 3. Importance of Tailored Responses:** Tailoring responses based on the sentiment and specific aspects mentioned in each review is crucial for effective customer engagement and satisfaction.
- 4. Opportunity for Improvement:** Negative reviews provide valuable insights into areas where the restaurant can improve, such as addressing issues with food quality, service, or ambiance.
- 5. Customer Engagement:** Engaging with customers by expressing gratitude for positive feedback and offering apologies and solutions for negative feedback can help build trust and loyalty.

## Conclusions:

- 1. Customer-Centric Approach:** Adopting a customer-centric approach by actively listening to customer feedback and providing tailored responses can enhance customer satisfaction and loyalty.
- 2. Continuous Improvement:** Regularly analyzing customer reviews and feedback allows the restaurant to identify areas for improvement and implement necessary changes to enhance the overall dining experience.
- 3. Building Relationships:** Responding to customer reviews in a timely and personalized manner demonstrates the restaurant's commitment to customer satisfaction and fosters positive relationships with patrons.
- 4. Competitive Advantage:** Implementing a solution to categorize and respond to customer reviews effectively can give the restaurant a competitive advantage by demonstrating responsiveness and attentiveness to customer needs.

## Recommendations:

- 1. Implement Sentiment Analysis:** Utilize sentiment analysis tools to automatically categorize customer reviews into positive, negative, and neutral sentiments, enabling efficient processing and response generation.
- 2. Invest in Customer Engagement Platforms:** Invest in customer engagement platforms or tools that facilitate the analysis of customer feedback and enable personalized responses based on sentiment and specific aspects mentioned in the reviews.
- 3. Train Staff for Response Generation:** Train staff members responsible for responding to customer reviews on how to craft tailored and empathetic responses that address customer concerns and reinforce positive experiences.
- 4. Monitor and Measure Impact:** Continuously monitor the impact of responses on customer satisfaction metrics such as review ratings, repeat visits, and customer feedback sentiment to gauge the effectiveness of the implemented solution.
- 5. Iterate and Improve:** Iterate on response strategies based on feedback and performance metrics, continuously improving the effectiveness of customer engagement efforts and enhancing the overall dining experience.

## Recommendations for Adopting a Similar Solution:

- **Choose the Right Tool:**
  - Evaluate sentiment analysis tools based on accuracy, scalability, and ease of integration.
  - Consider cloud-based APIs (e.g., Google Cloud Natural Language, Microsoft Azure Text Analytics) for efficient implementation.
- **Customize Responses:**
  - Develop personalized responses that address specific aspects mentioned in reviews.
  - Avoid generic replies; instead, acknowledge the customer's experience and offer relevant solutions.
- **Monitor Trends:**
  - Continuously analyze sentiment trends to identify patterns.
  - Detect emerging issues early and take proactive measures.
- **Privacy and Ethics:**
  - Ensure compliance with privacy regulations (e.g., GDPR).
  - Anonymize customer data during analysis to protect privacy.
- **Feedback Loop:**
  - Use insights to improve processes, train staff, and enhance offerings.
  - Encourage customers to provide feedback directly through surveys or follow-up emails.

# APPENDIX



**Happy Learning !**

