Chapter 1: Hotels and Surveys

Introduction

The Hyatt Hotel Corporation is one of the six major hotel corporations that dominate the American hotel industry. Hotels like it heavily rely on survey responses from their customers in order to make any improvements in their hospitality. Every survey completed by customers is an opportunity to improve; however, this requires a painstaking amount of manual review from employees. Countless numbers of hours are spent reading through reviews, organizing this data, creating action plans to fix issues, and often leads to long periods of inconsistency.

Background

Hospitality professionals working within large hotel chains have observed the lengthy and often inefficient process required to translate survey feedback into tangible improvements. Despite the industry's commitment to customer satisfaction, the manual review and implementation cycle frequently leads to delays in pragmatic change. Employees tasked with assessing guest reviews must comb through vast amounts of unstructured text data, organize findings, and formulate response strategies—a process that can extend weeks or even months before meaningful adjustments take effect. This inefficiency underscores the need for streamlined, data-driven solutions to enhance decision-making and responsiveness in the hospitality industry.

Customer feedback plays a crucial role in shaping the guest experience within the hospitality industry. Hotels like The Hyatt Regency of Green Bay rely on survey responses to identify service gaps, refine operational strategies, and enhance customer satisfaction. However, the process of analyzing feedback is overwhelmingly manual, requiring employees to sift through vast amounts of unstructured text data to extract actionable insights. This approach is not

only time-consuming but also susceptible to inconsistencies, leading to delayed responses and missed opportunities for meaningful improvements.

Furthermore, traditional feedback systems often fail to capture sentiment nuances and emerging trends effectively. Without a streamlined approach to categorizing survey data, hotels struggle to prioritize issues and optimize their decision-making process. As a result, guest concerns may go unaddressed, affecting overall brand reputation and long-term loyalty. To mitigate these challenges, there is a growing need for AI-driven automation in customer feedback analysis. By integrating sentiment analysis, summarization, and fine-tuned chatbot responses, hotels can systematically process survey data, identify patterns, and generate actionable recommendations—enhancing efficiency and ensuring a more proactive hospitality experience.

Statement of the Problem

The current approach to customer feedback analysis in the hospitality industry is slow, inconsistent, and labor-intensive, hindering hotels from making timely and effective improvements. Employees must manually sift through vast amounts of unstructured survey data, delaying actionable insights and reducing operational efficiency. Furthermore, traditional methods struggle to capture sentiment nuances and identify recurring themes, making it difficult to prioritize issues or respond effectively. Without an automated system to categorize feedback by sentiment, summarize common concerns, and generate timely AI-driven responses, hotels risk losing valuable opportunities to enhance guest experiences and strengthen brand loyalty.

Project Objectives

This project seeks to modernize customer feedback analysis for the Hyatt Regency of Green Bay by implementing Natural Language Processing (NLP) and deep learning techniques.

The dataset consists of nine years of hotel survey responses, providing a wealth of historical insights into guest sentiment and recurring concerns. The objective is to develop a systematic approach that eliminates the inefficiencies of manual review while improving the accuracy and responsiveness of hotel operations.

Significance of the Project

To achieve this, the project will establish an automated pipeline for processing guest feedback. First, an NLP-based sentiment analysis model will categorize customer comments according to sentiment, allowing the hotel to identify positive, neutral, and negative experiences efficiently. By doing so, hotel management can focus on the most critical issues affecting guest satisfaction.

Following sentiment classification, a text summarization algorithm will be employed to extract common themes from the survey responses, grouping them into recognizable patterns such as service quality, cleanliness, booking experience, or staff interactions. This structured organization will provide hotel leadership with actionable insights that are immediately applicable to operational improvements.

The final stage of the project involves developing an AI-powered automated response system tailored to customer feedback. Traditional automated responses often lack genuine empathy, producing replies that feel generic, impersonal, or overly rigid in tone. This system, however, will be designed to learn from human staff revisions, ensuring that responses maintain a natural, considerate, and emotionally intelligent approach to guest concerns. Instead of generating robotic or dismissive replies, the AI will be fine-tuned to recognize the nuances of customer sentiment, adapting responses to reflect the appropriate level of understanding, reassurance, or action required. By incorporating human oversight in its initial phases, the system

will gradually refine its approach, eventually allowing for autonomous responses that balance efficiency with sincerity, enhancing guest satisfaction without sacrificing the warmth that defines quality hospitality.

If the objectives of this project are successfully achieved, the impact on the hospitality industry, particularly at Hyatt Regency of Green Bay, will be substantial. Traditional survey analysis relies on a monotonous manual review, a process that is not only labor-intensive but also inconsistent and slow, delaying meaningful improvements in guest experience. By implementing Natural Language Processing (NLP) and deep learning techniques, this project will revolutionize how hotels handle customer feedback, leading to faster, more accurate insights with far less operational strain.

Through sentiment analysis, hotels will be able to identify critical issues more efficiently, prioritizing concerns that most affect customer satisfaction. Text summarization algorithms will ensure that recurring themes are categorized properly, allowing management to make data-driven decisions based on actual trends rather than anecdotal assessments. The AI-powered response system, unlike traditional automated replies that often lack empathy, will generate thoughtful, context-aware responses that align with customer sentiment, putting the personalization back into hospitality.

Beyond improving guest satisfaction, this project will enhance business efficiency by significantly reducing manual workload, allowing staff to focus on higher-value tasks such as strategy and personalized engagement. Over time, as the AI continues to refine its responses based on human feedback, the system will transition toward greater automation, ensuring long-term operational efficiency without compromising quality service. Ultimately, this project will set a new standard for the hospitality industry, demonstrating how AI-driven survey analysis

can help businesses stay responsive, optimize guest experiences, and maintain competitive advantage in an increasingly data-driven marketplace.

The broader impact of this project extends beyond operational efficiency and data-driven insights. By streamlining survey analysis and automating responses, employees will be freed from tedious data processing, allowing them to focus on what matters most—caring for people so that they can be their best, the guiding principle of hospitality at the Hyatt Regency. This balance of technology and human connection ensures that service remains thoughtful and personal, reinforcing the hotel's commitment to creating exceptional guest experiences while embracing the advantages of AI-driven innovation.

Assumptions, Limitations, and Delimitations

The success of this project relies on several key assumptions, limitations, and delimitations that define its scope and potential impact. One fundamental assumption is that customer survey responses provide a valuable reflection of guest sentiment, though they may be influenced by external factors beyond hotel service itself. Some guests, particularly those experiencing personal hardships or medical emergencies involving family members, may provide feedback shaped by emotional circumstances rather than an objective evaluation of hospitality operations. Understanding these nuances is critical when interpreting feedback data and implementing AI-driven solutions.

Despite its advantages, the project does have limitations that must be acknowledged. Because the dataset is specific to Hyatt Regency of Green Bay, hotels in other regions may require modifications to apply these findings effectively. AI-driven sentiment analysis, while powerful, may sometimes misinterpret complex expressions such as sarcasm, mixed sentiment, or cultural differences, necessitating human review for accuracy. Additionally, automated

responses, although designed to learn and improve over time, may initially lack full personalization in handling intricate guest complaints that require nuanced human judgment. Another constraint is the historical nature of the dataset, spanning nine years, which may not fully align with evolving guest expectations or industry trends.

The project also has clear delimitations to maintain focus on survey-based analysis. It does not incorporate customer insights from social media, online reviews, or direct verbal interactions, meaning that broader sentiment data beyond surveys remains outside the scope. Furthermore, only written text responses are analyzed, excluding feedback that may come from spoken language or non-verbal cues. Moreover there also may not be enough data to increase the AI models accuracy in predictions, so more data may need to be pulled from other resources in order to increase proficency. Lastly, the AI model is tailored specifically for Hyatt Regency's operational needs, meaning it is not designed to be universally applicable to all hospitality brands without further adaptation. These assumptions, limitations, and delimitations frame the project's expectations, ensuring a realistic and effective approach to improving customer feedback analysis within the hotel industry.

Conclusion

This project will generate operational efficiency in ways never seen before. The result of the NLP and machine learning algorithms should allow for immediate action to several problems, some that may not have been identifiable until now. While The Hyatt Regency of Green Bay has begun to delve into analysis using Data Science, there is a lot to learn from this project, as its solutions will ultimately help several key areas of shortcomings that have yet to focus their horizons on.