



Customer Experience Analysis for Marketing Strategy Optimization Using CRAF Framework

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Abstract—This research explores the critical role of leveraging digital data and structured frameworks, specifically the Customer Review and Analysis Framework (CRAF), to optimize customer experience in the hospitality industry. Analyzing 1,028 guest reviews from Ayaka Suites Hotel reveals that 987 posts are positive, while only 40 are negative, indicating overall high satisfaction levels. The effectiveness of the Support Vector Machine (SVM) model for sentiment classification is demonstrated, achieving an accuracy of 94.99% without SMOTE and 89.22% with SMOTE. Furthermore, deploying the analysis results using Oracle APEX enables creating an interactive information system that provides real-time insights into customer feedback, facilitating dynamic data management and strategy adjustments. The findings underscore the importance of comprehensive feedback analysis for identifying improvement areas, enhancing service quality, and elevating guest satisfaction. The study concludes that adopting systematic frameworks like CRAF, advanced analytical models like SVM, and interactive deployment platforms like Oracle APEX is essential for achieving long-term success and maintaining high standards in service delivery within the hospitality sector.

Keywords: Customer Experience; Hospitality Industry; Sentiment Analysis; Support Vector Machine (SVM); Oracle APEX.

1. INTRODUCTION

Optimizing customer experience is paramount for enhancing product and service sales and fostering customer loyalty and satisfaction. A superior customer experience encourages repeat business and attracts new customers through positive word-of-mouth (Altuwaim, AlTasan, & Almohsen, 2024; Awa, Ikwor, & Ademe, 2021; Lu & Liao, 2023; P.J et al., 2023). Enhanced interaction quality and personalized services are crucial elements that can significantly influence purchasing decisions and customer retention rates (Nwokorie, Igbojekwe, & Ukabuilu, 2024; Nwokorie et al., 2024; Simanjuntak, Putri, Yuliati, & Sabri, 2020). As businesses increasingly recognize the direct correlation between customer experience and financial performance, strategic investments in customer-centric initiatives become imperative. In conclusion, prioritizing customer experience is a strategic move that can drive long-term growth and sustainability for any organization.

To enhance consumer experience, marketing strategies must be meticulously designed to align with the target market. Effective segmentation and precise targeting are essential in addressing diverse consumer groups' needs and preferences (Valencia, Cerio, & Biases, 2022; Yang, Zhu, Liao, & Wu, 2023). Utilizing data analytics and market research to inform these strategies ensures a more personalized and engaging customer interaction (Wahyuningsih, Nasution, Yeni, & Roostika, 2022; Zhang & Zhao, 2023). Such tailored marketing approaches elevate consumer satisfaction, strengthen brand loyalty, and drive sales growth. Therefore, an optimized, target-focused marketing strategy is crucial for superior consumer experiences and sustainable business success.

In the hospitality industry, guests evaluate products and services based on several critical factors, including cleanliness, service, value for money, location, room comfort and quality, and facilities. Maintaining impeccable cleanliness and providing excellent service are fundamental to establishing a positive first impression (Mofokeng, 2021; Supriyanto, Wiyono, & Burhanuddin, 2021). Ensuring that the value proposition aligns with guests' expectations regarding location, room standards, and available facilities significantly influences their satisfaction (Tata, Sharrock, & Westerlaken, 2023; Tata et al., 2023). A hotel that excels in these areas attracts repeat visitors and enhances its reputation through positive reviews. Focusing on these critical aspects is essential for sustaining competitive advantage and achieving long-term success in the hospitality sector.

This study aims to analyze consumer experiences using the CRAF framework, based on review data of Ayaka Suites Hotel, Kuningan, Jakarta, from the Agoda platform. The CRAF framework, which encompasses customer feedback, responses, actions, and future improvements, provides a comprehensive tool for evaluating guest satisfaction (Singgalen, 2024). By systematically examining these reviews, insights into service quality, facility standards, and overall guest perceptions are obtained. The analysis posits that leveraging detailed guest feedback facilitates targeted enhancements, driving higher customer satisfaction and loyalty. Thus, applying the CRAF framework is instrumental in refining hotel operations and achieving superior guest experiences.

The Customer Review and Analysis Framework (CRAF) possesses significant advantages in processing consumer review data, particularly for hotel guests. This framework systematically categorizes and evaluates feedback, enabling a detailed understanding of guest experiences (Iloranta & Komppula, 2022). By utilizing advanced data analytics, CRAF identifies key trends and areas for improvement, providing actionable insights for hotel management. Its ability to

transform raw review data into strategic information enhances decision-making processes and improves service. Consequently, CRAF is a valuable tool in optimizing hotel operations and ensuring high levels of guest satisfaction.

The urgency of this research lies in its potential to significantly enhance consumer experience and business performance within the hospitality industry. As customer expectations evolve, staying attuned to their needs through systematic analysis becomes increasingly vital (Mariani & Borghi, 2023). Leveraging frameworks such as the Customer Review and Analysis Framework (CRAF) ensures that hotels effectively interpret and respond to guest feedback. By identifying critical areas for improvement and implementing targeted strategies, hotels are better positioned to meet and exceed customer expectations. Therefore, this research is crucial in driving innovation, maintaining competitive advantage, and achieving sustained success in the hospitality sector.

This research's multifaceted theoretical and practical contributions offer valuable insights and applications in the hospitality industry. Theoretically, this study enriches existing literature by providing a nuanced understanding of customer experience analysis through the Customer Review and Analysis Framework (CRAF). Practically, it equips hotel managers with actionable strategies for enhancing service quality and guest satisfaction (Gazi et al., 2024). This research underscores the importance of data-driven decision-making in the hospitality sector by bridging the gap between theory and practice. Consequently, its findings are instrumental in fostering academic advancement and operational excellence.

Similar research and the limitations of this study are primarily situated within the framework and the case study context. Comparative studies have utilized various frameworks for customer experience analysis, highlighting the diversity of methodological approaches. However, applying the Customer Review and Analysis Framework (CRAF) to Ayaka Suites Hotel in Jakarta presents unique insights that may not be generalizable to other settings. The reliance on a single case study limits the broader applicability of the findings. Therefore, while the research offers valuable contributions, its scope is constrained, necessitating further studies across different contexts to validate and expand upon the results.

Recommendation for further research involves expanding the scope of analysis to include a diverse range of hotel categories and geographic locations. Conducting comparative studies across various hospitality sectors will provide a more comprehensive understanding of the Customer Review and Analysis Framework (CRAF)'s applicability and effectiveness. Additionally, integrating advanced analytical tools and techniques could enhance the depth of insights gained from customer feedback. This broader approach will validate the framework's utility and uncover nuanced differences in customer experience management. Hence, future research should explore these dimensions to enrich the field's knowledge base and practical applications.

2. RESEARCH METHODS

2.1 Gap Identification and Analysis using Vosviewer

The analysis gap in previous studies on customer experience in the hospitality industry is crucial in optimizing efforts to provide empirical and theoretical contributions. This research employs Vosviewer for network visualization of interrelated topics to identify areas needing further enhancement. By mapping these connections, the study highlights underexplored dimensions and offers a structured approach for future investigations. This method addresses existing gaps and guides the development of more comprehensive and effective strategies. Consequently, this research significantly advances the understanding and application of customer experience optimization in the hospitality sector.

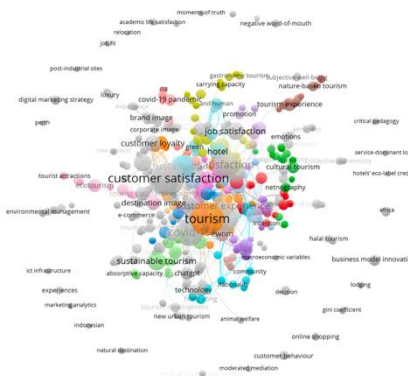


Figure 1. Network Visualization using Vosviewer

Figure 1 shows the network visualization using Vosviewer. Based on the identification of gaps, it is evident that studies on hotel customer experience are closely linked to tourism, customer satisfaction, customer loyalty, and sustainable tourism (Al-Abyadh et al., 2024; Chen et al., 2022; López-Sánchez, Bermeo-Giraldo, Valencia-Arias, Bao García, & Gallegos, 2023; Oklevik, Nysveen, & Pedersen, 2022; Tschelisnig & Westerlaken, 2022). These interconnected themes underscore the multifaceted nature of guest experiences and their broader implications for the hospitality industry (Chikazhe, Makanyeza, & Chigunhah, 2021). Understanding these relationships facilitates the development of holistic strategies that enhance guest satisfaction and promote long-term customer loyalty and sustainability (Saut & song, 2022).

Integrating these elements is essential for achieving a balanced approach that benefits the business and its clientele. Therefore, addressing these gaps is crucial for advancing theoretical and practical insights in hospitality management.

This indicates the significance of conducting this research due to its theoretical and empirical contributions. Theoretically, the study enriches the existing body of knowledge by providing new insights into customer experience management within the hospitality sector. Empirically, it offers practical recommendations that can be directly applied to enhance service quality and customer satisfaction. The research underscores the importance of data-driven strategies in improving customer loyalty and achieving sustainable business growth by bridging the gap between theory and practice. Therefore, this research is vital for advancing academic understanding and practical applications in hospitality management.

2.2 Customer Reviews and Analysis Framework (CRAF)

The CRAF framework can be tailored to the specific business context and data being analyzed, with particular relevance to the consumer review data of Ayaka Suites Hotel. A more precise and actionable analysis is achievable by adapting the framework to accommodate the hotel’s unique customer feedback characteristics. This customization enables a deeper understanding of guest experiences, highlighting critical service improvement and strategic development areas. Such a targeted approach not only maximizes the relevance of the findings but also enhances the practical utility of the framework. Therefore, the adaptability of the CRAF framework is crucial for deriving meaningful insights in varied business scenarios.

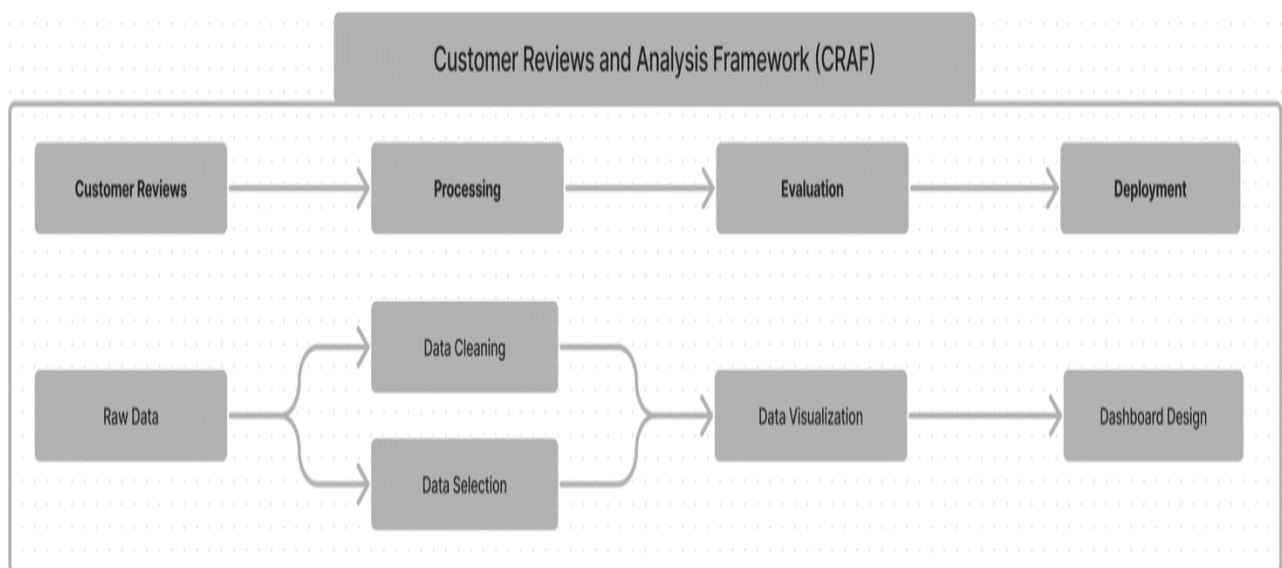


Figure 2. Customer Reviews and Analysis Framework (CRAF)

Figure 2 shows the implementation of CRAF. The stages within the CRAF framework consist of customer reviews, processing, evaluation, and deployment. Initially, customer reviews are collected and aggregated to form a comprehensive dataset. This data then undergoes processing, where advanced analytical techniques are applied to extract relevant insights and identify patterns. During the evaluation phase, these insights are meticulously assessed to determine areas of strength and opportunities for improvement. Finally, the deployment stage involves implementing the derived strategies to enhance customer satisfaction and operational efficiency. Consequently, the CRAF framework provides a structured and practical approach to optimizing customer experience management.

The advantages of the CRAF framework in processing Ayaka Suites Hotel data significantly enhance customer experience. By systematically analyzing customer reviews, the framework identifies critical areas for improvement, allowing for targeted interventions. The processing stage employs sophisticated analytical techniques to uncover deep insights into guest preferences and pain points. This structured approach ensures that the evaluation phase translates insights into actionable strategies, directly addressing customer needs. Ultimately, deploying these strategies fosters a superior and personalized guest experience, demonstrating the framework's efficacy in driving customer satisfaction and loyalty.

2.2.1 Customer Reviews

In the customer reviews stage, it is essential to identify the key indicators that consumers evaluate regarding the products and services at Ayaka Suites Hotel. These indicators typically include cleanliness, service quality, value for money, location, room comfort, and available facilities. Understanding these components allows for a comprehensive analysis of guest feedback, highlighting strengths and areas needing improvement. The hotel can better tailor its offerings to meet customer expectations by focusing on these specific indicators. Consequently, this targeted approach ensures a more effective enhancement of the overall guest experience.



Figure 3. Rating of Ayaka Suites Hotel on Agoda and Booking.com Platform

Figure 3 shows the rating of Ayaka Suites Hotel on Agoda and Booking.com. Based on Agoda data from 3,654 reviews and 1,188 verified guest comments, the ratings for various indicators at Ayaka Suites Hotel are as follows: Cleanliness 8.9, Service 8.9, Value for Money 8.9, Location 8.8, Room Comfort and Quality 8.7, and Facilities 8.5. The descriptive ratings are categorized as 9+ Exceptional (601), 8-9 Excellent (205), 7-8 Very Good (250), 6-7 Good (62), and below 6 Below Expectation (70). These ratings reflect a consistently high level of guest satisfaction, particularly in cleanliness, service, and value for money. The slightly lower scores in-room comfort, quality, and facilities indicate potential areas for improvement. Therefore, addressing these aspects can further elevate the overall guest experience at Ayaka Suites Hotel.

Based on Booking.com data, from 563 reviews and 251 verified guest comments, the ratings for various indicators at Ayaka Suites Hotel are as follows: Cleanliness 8.5, Facilities 8.1, Location 8.4, Room Comfort and Quality 8.5, Service 8.9, and Value for Money 8.4. The descriptive ratings are categorized as 9+ Exceptional (601), 8-9 Excellent (205), 7-8 Very Good (250), 6-7 Good (62), and below 6 Below Expectation (70). These scores suggest that while service stands out with the highest rating, other aspects, such as facilities and value for money, have room for improvement. Enhancing these areas can help achieve higher overall guest satisfaction. Consequently, focusing on these indicators will provide a more balanced and enhanced customer experience at Ayaka Suites Hotel.

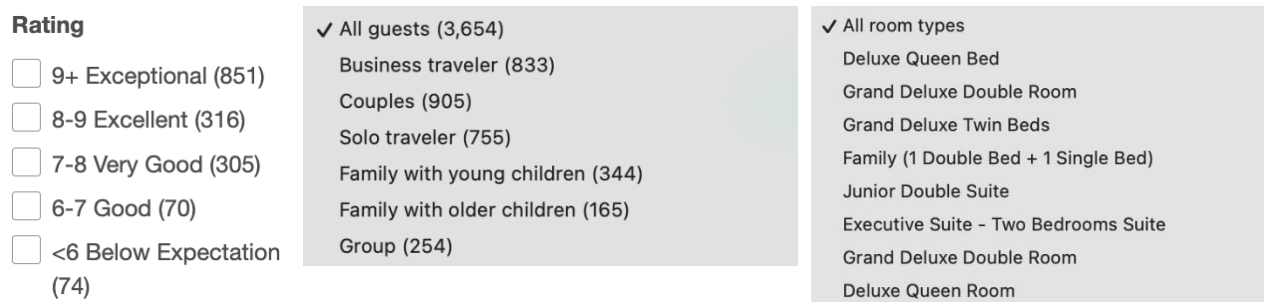


Figure 4. Rating Description, Guest, and Room Type

Figure 4 shows the platform's rating description, guest, and room type. Based on Agoda data, the number of reviews categorized by guest type is as follows: Business travelers (833), Couples (905), Solo travelers (755), Families with young children (344), Families with older children (165), and Groups (254). This distribution highlights the diverse clientele of Ayaka Suites Hotel, with couples and business travelers representing the most significant segments. Such diversity necessitates a tailored approach to service and amenities to cater to the specific needs of each guest category. Consequently, understanding these demographic segments is crucial for enhancing the overall guest experience and ensuring satisfaction across different types of visitors.

Based on Agoda data, the available room types at Ayaka Suites Hotel are as follows: Deluxe Queen Bed, Grand Deluxe Double Room, Grand Deluxe Twin Beds, Family (1 Double Bed + 1 Single Bed), Junior Double Suite, Executive Suite - Two Bedrooms Suite, Grand Deluxe Double Room, and Deluxe Queen Room. This variety of room types caters to guests' needs and preferences, from solo travelers to families and groups. Each room type offers different features and amenities, contributing to the overall guest experience. Understanding the preferences and feedback of each room type is essential for the hotel to make informed decisions about service improvements and ensure high customer satisfaction. Consequently, such data-driven insights are crucial for maintaining and enhancing the quality of accommodations Ayaka Suites Hotel offers.

2.2.2 Processing

In the processing stage, 1176 text data entries were cleansed using RapidMiner, resulting in 1028 entries suitable for modeling. This data-cleaning process involved removing irrelevant information, correcting inconsistencies, and standardizing formats to ensure data integrity. The refined dataset is crucial for accurate and reliable modeling, which forms the basis for subsequent analysis. By employing advanced data processing techniques, the quality and usability of the data are significantly enhanced. Consequently, this meticulous preparation step is essential for achieving robust and meaningful analytical outcomes.

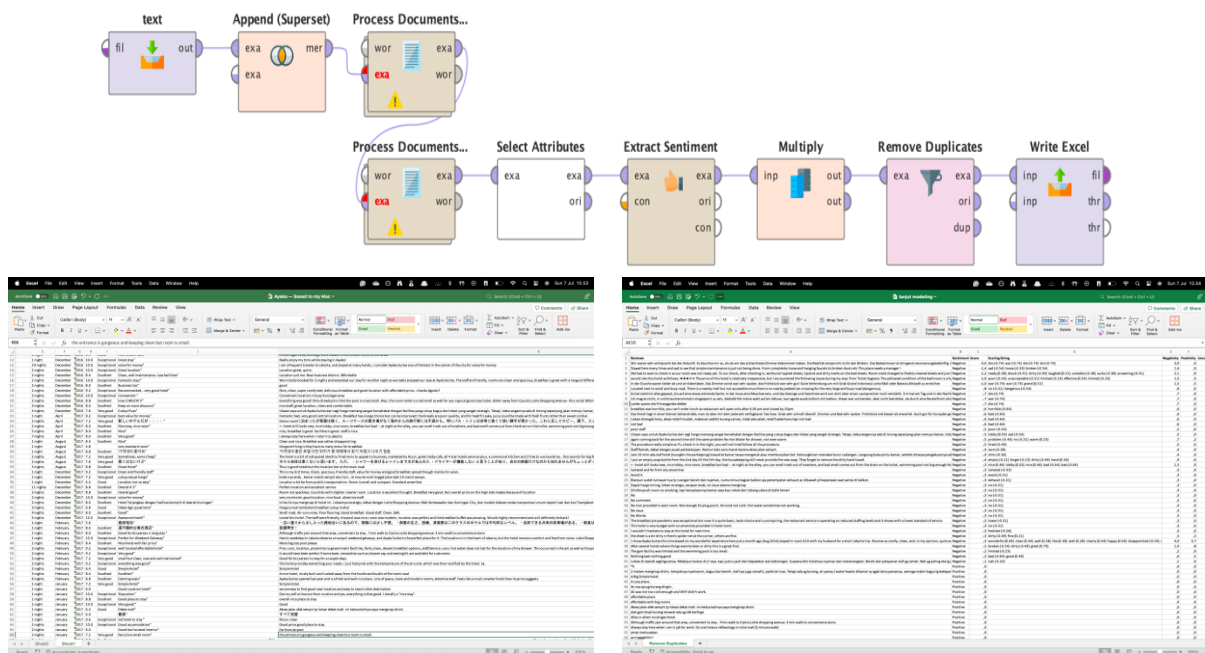


Figure 5. Data Cleaning and Extraction

Figure 5 shows the data-cleaning process. The data cleansing process utilized operators such as tokenize, filter tokens, transform cases, stopwords and stem. Initially, the tokenize operator segmented the text into individual tokens, facilitating detailed analysis. Subsequently, the filter tokens operator removed irrelevant and low-frequency words, enhancing the dataset's focus. The transform cases operator standardized the text by converting all tokens to a uniform case, while the stopwords operator eliminated common but non-informative words. Finally, the stem operator reduced tokens to their root forms, ensuring consistency and aiding in more accurate pattern recognition. This comprehensive cleaning process is crucial for optimizing data quality and analytical precision.

Table 1. Extraction Result

Reviews	Score String	Score	Label
Stayed here many times and sad to see that simple maintenance is just not being done. From completely loose and hanging faucets to broken doors etc This place needs a manager !	sad (-0.54) loose (-0.33) broken (-0.54)	-1,41025641025641	Negative
Location - easy access to the main road, 10mins walk to lotte kuningan mall, 24 hours food stalls. Sleeping quality - very good, bed is great, pillows are great, aircond is cold. Room - thin wall, good internet connection, hot water/shower was perfect, very minimum toiletries, balcony view was good (for high floors).	easy (0.49) good (0.49) great (0.79) good (0.79) perfect (0.69) good (0.49)	4,23076923076923	Positive

Table 1 shows the extraction result of the dataset. The sentiment extraction process employed the VADER model. This model is particularly effective for analyzing the sentiment of textual data, as it is designed to handle the nuances of natural language. By leveraging VADER, the analysis accurately categorized the sentiments expressed in the reviews into positive, negative, and neutral categories. The model's ability to quantify sentiment intensity further enriched the understanding of customer feedback. Therefore, utilizing VADER for sentiment analysis provides a detailed sentiment profile and enhances the accuracy and depth of the overall data analysis.

Based on the sentiment extraction results, the data can be interpreted to discuss customer experience at Ayaka Suites Hotel. The sentiment analysis reveals patterns and trends in guest feedback, highlighting areas of satisfaction and dissatisfaction. Positive sentiments typically correlate with high service quality, comfortable accommodations, and favorable amenities, while negative sentiments often indicate areas needing improvement. This detailed interpretation of sentiment data provides actionable insights for enhancing guest experiences. Consequently, integrating these findings into the hotel's strategic planning can improve customer satisfaction and loyalty, ensuring a competitive advantage in the hospitality industry.

2.2.3 Evaluation

In the evaluation stage, guest rating data for indicators related to Cleanliness, Service, Value for Money, Location, Room Comfort and Quality, and Facilities can be reviewed. This comprehensive assessment allows an in-depth understanding of guests' perceptions and experiences in these critical areas. By analyzing these ratings, strengths and weaknesses in the hotel's offerings can be identified, providing a clear picture of overall performance. Such insights are crucial for making informed decisions about where to focus improvement efforts. Ultimately, this evaluation process is essential for enhancing guest satisfaction and ensuring the continued success of Ayaka Suites Hotel.

Subsequently, the sentiment extraction results can proceed to the modeling stage to test the performance of algorithms in classifying sentiments into negative and positive classes. In this research context, the algorithms being tested are Decision Tree (DT), Naive Bayes Classifier (NBC), k-Nearest Neighbors (k-NN), and Support Vector Machine (SVM). These algorithms are evaluated for accuracy, precision, recall, and overall effectiveness in sentiment classification. The comparative analysis of these models provides insights into their suitability for sentiment analysis tasks. Ultimately, this modeling stage is crucial for determining the most effective algorithm for accurately classifying guest sentiments at Ayaka Suites Hotel.

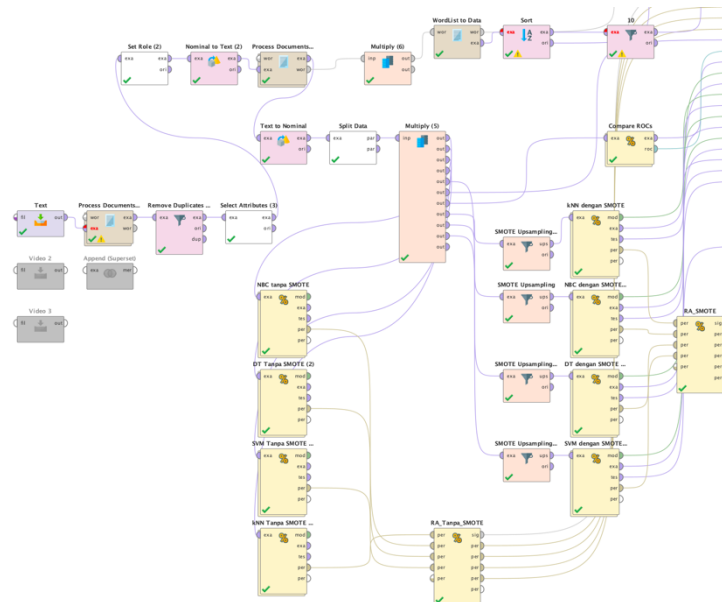


Figure 6. Performance Evaluation of Classification Model

Figure 6 shows the performance evaluation of NBC, DT, k-NN, and SVM. The evaluation results of the algorithm performance can be analyzed based on accuracy, precision, recall, F-measure, and Area Under Curve (AUC) values. Accuracy measures the overall correctness of the model, while precision assesses the ratio of accurate optimistic predictions to the total predicted positives. Recall evaluates the model's ability to identify all relevant instances, and the F-measure provides a harmonic mean of precision and recall, offering a balanced performance metric. The AUC, representing the model's ability to distinguish between classes, further enhances the evaluation. Analyzing these metrics provides a comprehensive understanding of each algorithm's strengths and weaknesses, guiding the selection of the most effective model for sentiment classification. Consequently, these insights are essential for optimizing sentiment analysis processes and improving predictive accuracy.

Subsequently, the evaluation results are visualized according to the information needs of users analyzing customer experience from review data. This visualization process involves creating clear, insightful graphs and charts highlighting

key performance metrics and sentiment trends. Such visual representations enable users to grasp complex data patterns and draw actionable conclusions quickly. By tailoring these visualizations to the specific requirements of the stakeholders, the analysis becomes more accessible and relevant. Ultimately, effective visualization enhances decision-making processes, facilitating the implementation of strategies to improve customer satisfaction and loyalty based on empirical insights.

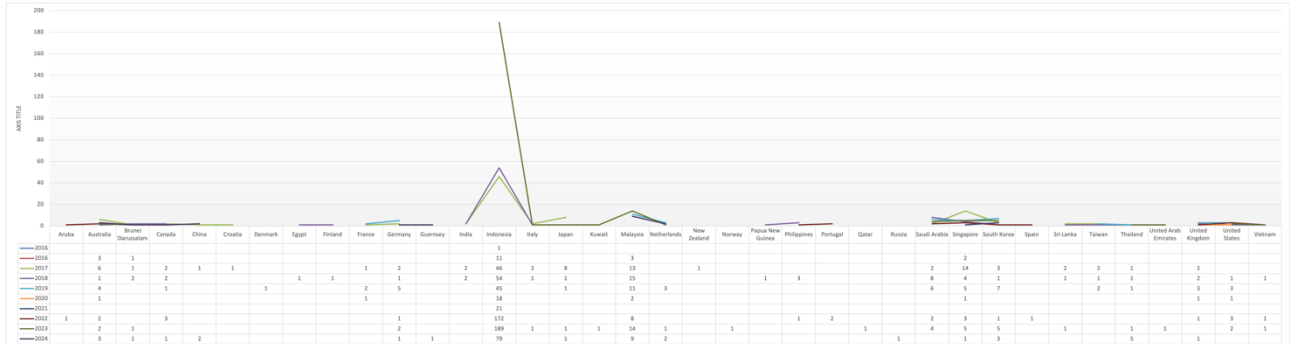


Figure 7. Country of Origin and Date of Stay

Figure 7 shows the country of origin and Date of stay. Several trends can be identified based on the hotel guest data classified by country of origin and year's stay. Most guests are from Indonesia, which has peaked notably in recent years. Other significant sources of guests include Malaysia, Singapore, and Australia, indicating a robust regional preference. The data also shows varying numbers of guests from Europe and North America, albeit in smaller proportions. This classification highlights the hotel's appeal to local and international travelers, suggesting a broad market reach. Consequently, understanding these trends can inform targeted marketing strategies and enhance the overall guest experience.

To facilitate decision-making processes to enhance hotel customer experience, data visualization must be accommodated through an interactive system for decision-makers. Such a system allows for dynamic exploration of guest feedback and operational metrics, providing a clear and comprehensive view of performance indicators. Interactive visualizations enable managers to quickly identify trends, pinpoint issues, and assess the effectiveness of implemented strategies. This approach streamlines the decision-making process and enhances the accuracy and relevance of the insights derived. Consequently, investing in advanced visualization tools is essential for continuously improving customer satisfaction and operational efficiency.

2.2.4 Deployment

In the deployment stage, data related to customer experience can be visualized using Oracle APEX as an information system designed explicitly for decision-makers at Ayaka Suites Hotel. This system facilitates the creation of interactive dashboards and reports, allowing managers to monitor and analyze key performance indicators efficiently. By leveraging Oracle APEX, the hotel can transform raw data into actionable insights, thus enabling informed decision-making. Such an advanced information system ensures that strategic initiatives are based on accurate, real-time data. Consequently, this approach significantly enhances the hotel's ability to improve customer satisfaction and operational effectiveness.

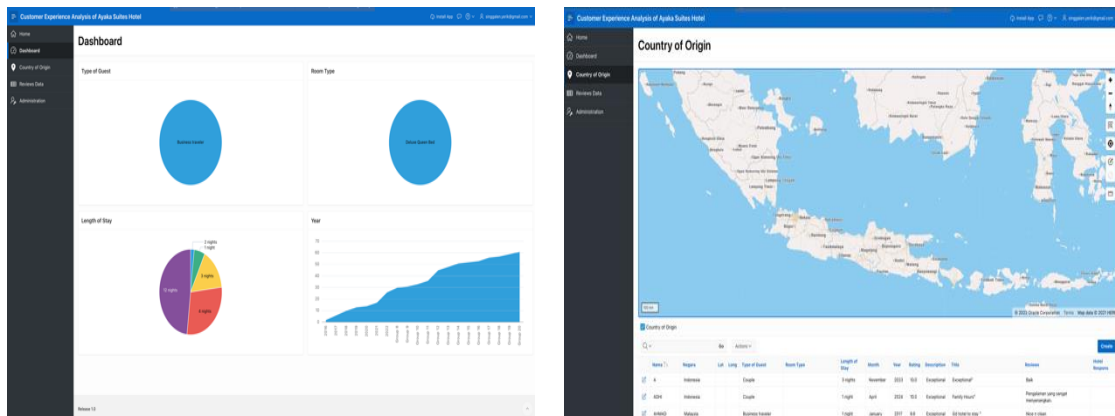


Figure 8. User Interface of Customer Experience Analysis Application

Figure 8 shows the user interface of the customer experience analysis application. The application is designed to display a dashboard page, presenting specific data about the guest's country of origin, guest type, room type, length of stay, month and year, ratings, and reviews. This dashboard enables a comprehensive overview of various metrics, facilitating a detailed analysis of customer demographics and preferences. By integrating these elements, the application allows decision-makers to identify patterns and trends in guest behavior and satisfaction. Such a detailed and interactive

visualization tool enhances the ability to make data-driven decisions. Consequently, this approach ensures the hotel can effectively address customer needs and improve overall service quality.

Thus, the policy-making process to enhance the consumer experience at Ayaka Suites Hotel can leverage the data processed in this research. The structured analysis and visualization of guest feedback provide actionable insights into critical areas such as service quality, room comfort, and overall satisfaction. The hotel management implements targeted improvements and strategic initiatives by utilizing these insights. This data-driven approach ensures informed and effective decisions, increasing customer satisfaction and loyalty. Consequently, the processed data is vital for optimizing the guest experience and achieving long-term success.

3. RESULTS AND DISCUSSION

The discussion is divided into two sections: customer experience analysis and discussion. The first section delves into the comprehensive examination of guest feedback, identifying key trends and areas for improvement. This analysis provides a detailed understanding of the factors influencing customer satisfaction and loyalty. The second section focuses on interpreting these findings, offering insights into their implications for strategic decision-making. By systematically addressing both analysis and interpretation, the discussion ensures a thorough evaluation of customer experiences. Consequently, this structured approach enhances the clarity and depth of the overall research findings.

3.1 Customer Experience Analysis

Customer experience analysis is essential for optimizing the marketing strategies of Ayaka Suites Hotel and understanding guest preferences and needs during their stay. This analysis provides valuable insights into what guests appreciate and areas where the hotel can improve, enabling more targeted and effective marketing efforts. The hotel can better tailor its services to meet customer expectations by identifying specific trends and patterns in guest feedback. A thorough understanding of customer experiences ultimately leads to enhanced satisfaction and loyalty. Consequently, incorporating this analysis into the hotel's strategic planning is crucial for sustaining competitive advantage and ensuring long-term success.

Table 2. Type of Guest and Room

Type of Room/Type of Guest	Business traveler	Couple	Family with teens	Family with young children	Group	Solo traveler	Grand Total
Deluxe Queen Bed	87	92	17	53	16	82	347
Deluxe Queen Room	3	1				1	5
Deluxe Room		2	2	1	1		6
Double Deluxe Room	1						1
Double or Twin Grand Deluxe King or Grand Deluxe Twin - BED AND BREAKFAST	1						1
Executive Suite - Two Bedrooms Suite	2	2	2	2	3	3	14
Family (1 Double Bed + 1 Single Bed)	9	4	10	11	3	2	39
Grand Deluxe Double Room	25	27	5	20	10	21	108
Grand Deluxe Twin Beds	13	9	3	12	2	5	44
Junior Double Suite	7	3		3		5	18
Grand Total	148	140	39	102	35	119	583

Table 2 represents the number of guests and rooms classified according to their respective types. The most popular room type at Ayaka Suites Hotel is the Deluxe Queen Bed, attracting a diverse range of guests. This room type hosted 87 business travelers, 92 couples, 17 families with teens, 53 families with young children, 16 groups, and 82 solo travelers, totaling 347 guests. The broad appeal of this room type suggests it meets various preferences and requirements, making it a versatile choice for different guest segments. Its popularity indicates a well-balanced combination of comfort, amenities, and value.

Consequently, enhancing the features and services of the Deluxe Queen Bedroom can further improve guest satisfaction and maintain its high occupancy rates. The Double Deluxe Room is the least popular room type based on guest type at Ayaka Suites Hotel. This room type only accommodated a single business traveler, making it the least preferred option among all guest categories. This low occupancy suggests that the Double Deluxe Room may not meet the specific needs or preferences of the majority of guests. Potential factors contributing to its unpopularity include the room's amenities, pricing, or overall appeal. Consequently, it may be beneficial for the hotel to reassess and enhance the features of this room type to attract a broader range of guests and improve its occupancy rates.

Table 3. Type of Guest and Length of Stay

Length of Stay	Business traveler	Couple	Family with teens	Family with young children	Group	Solo traveler	Grand Total
1 night	105	132	36	81	28	107	489
10 nights						1	1
11 nights	1					2	3
12 nights	1						1
13 nights		1					1
14 nights						1	1
2 nights	58	48	17	43	25	40	231
26 nights						1	1
3 nights	28	27	7	25	6	25	118
4 nights	18	12	2	4	4	7	47
5 nights	8	2	1	2	1	7	21
6 nights	6	3	2	1	1	4	17
7 nights	1			1		2	4
8 nights		2					2
9 nights	2	1				2	5
Grand Total	228	228	65	157	65	199	942

Table 3 shows the type of guest and length of stay. Table 3 can determine guests' length of stay based on their characteristics or type, as illustrated by the following data. The table provides insights into the average duration of stays across different guest categories, including business travelers, couples, families with young children, families with teens, groups, and solo travelers. For instance, business travelers generally have shorter stays, typically averaging 1 to 3 nights, reflecting their focused, often work-related visits. In contrast, families with young children and groups tend to have more extended stays, ranging from 4 to 7 nights, indicating a preference for more extended vacations. This analysis highlights the varying needs and behaviors of different guest segments, which can inform tailored service offerings and promotional strategies. Consequently, understanding these patterns is crucial for optimizing hotel operations and enhancing overall guest satisfaction.

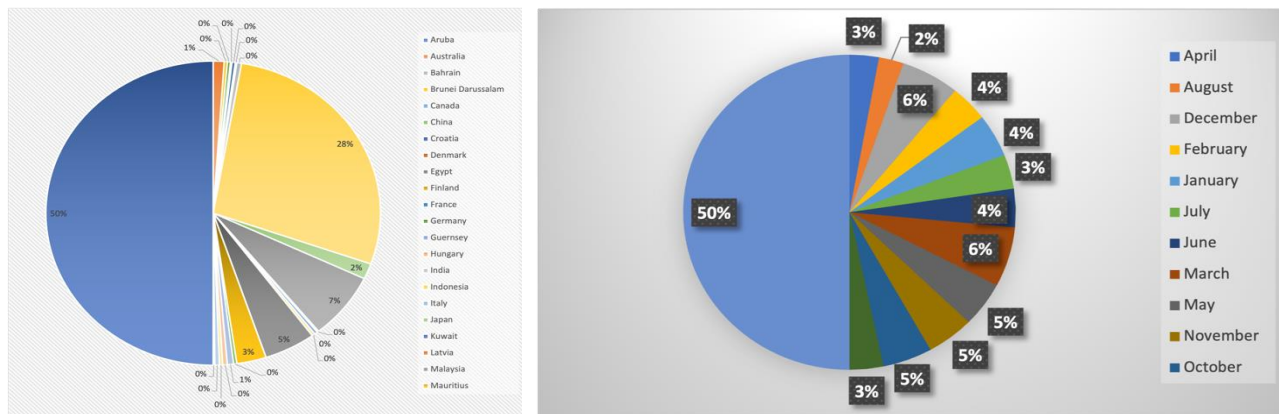


Figure 9. Guest Country of Origin and Month of Stay

Figure 9 shows the country of origin and month of stay. The data on the number of guests based on their country of origin is as follows. Indonesia has the highest number of guests, totaling 745, with a significant representation across all guest types. Malaysia follows with 107 guests, while Singapore and Australia also show substantial numbers with 55 and 31 guests, respectively. Business travelers are predominantly from Indonesia (184) and Singapore (33), while couples mainly come from Indonesia (201) and Malaysia (47). Families with young children mainly originate from Indonesia (139) and Malaysia (13). This distribution indicates a strong regional influence on guest demographics. Consequently, these insights can inform targeted marketing strategies and service customization to cater to guests' preferences from different countries, enhancing overall guest satisfaction and hotel performance.

The data on the number of guests based on the month of stay is as follows. December shows the highest number of guests with 115, indicating a peak travel season, followed by November with 85 and May with 95. Business travelers are notably high in March (28) and November (21), while couples predominantly visit in December (30) and May (30). Families with young children have significant stays in December (19) and July (8). Solo travelers peak in March (29) and December (15). This distribution reveals seasonal trends and preferences among different types of guests, which can guide promotional strategies and resource allocation. Consequently, understanding these monthly patterns is crucial for optimizing occupancy rates and tailoring services to meet guest demands throughout the year.

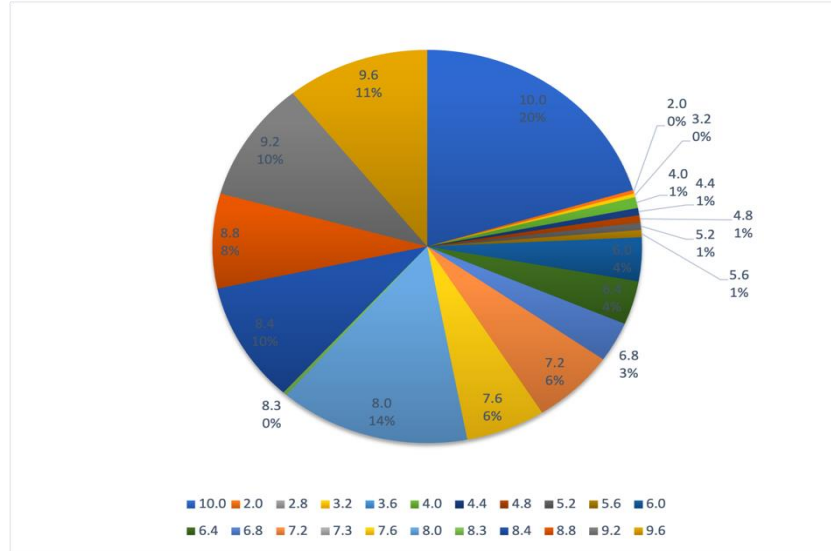


Figure 10. Guest Rating Based on Customer Experience

Figure 10 shows the guest ratings for the products and services received as follows: 9+ Exceptional, 8-9 Excellent, 7-8 Very Good, 6-7 Good, and below 6 Below Expectation. Couples provided the highest number of exceptional ratings (128), followed by business travelers (68) and solo travelers (60). Business travelers and couples also gave many excellent ratings, each totaling 33. The ratings were predominantly from business travelers (48) and solo travelers (24). Good ratings were relatively low, with business travelers (12) and solo travelers (9) providing the most in this category. Ratings below expectations were minimal, indicating that most guests were satisfied with their stay. This detailed rating analysis highlights the hotel's strengths in meeting guest expectations and identifies areas for potential improvement. Consequently, these insights are essential for continuously enhancing service quality and guest satisfaction at Ayaka Suites Hotel.

Based on the rating data, it is evident whether positive or negative aspects dominate customer experience. Most ratings fall within the 9+ Exceptional and 8-9 Excellent categories, indicating a predominantly positive customer experience. For instance, couples and business travelers provided the highest number of exceptional ratings, while very good ratings were also significant among solo travelers and families with young children. Conversely, the number of ratings below 6, indicating negative experiences, is minimal across all guest types. This distribution highlights guests' satisfaction with the hotel's services and amenities. Consequently, the predominance of high ratings underscores the effectiveness of the hotel's efforts in delivering a superior guest experience.

3.2 Sentiment Classification Based on Reviews Dataset

Based on the classification of 1,028 posts using the VADER model, it can be determined that 40 posts fall into the negative class, while 987 posts fall into the positive class. This significant disparity highlights a predominantly positive customer sentiment towards the hotel's services and amenities. The VADER model's ability to classify sentiment accurately provides valuable insights into overall guest satisfaction. The relatively low number of negative posts suggests that most customers had favorable experiences. Consequently, this data underscores the hotel's success in maintaining high levels of customer satisfaction while also identifying areas that may require further attention to minimize negative feedback.

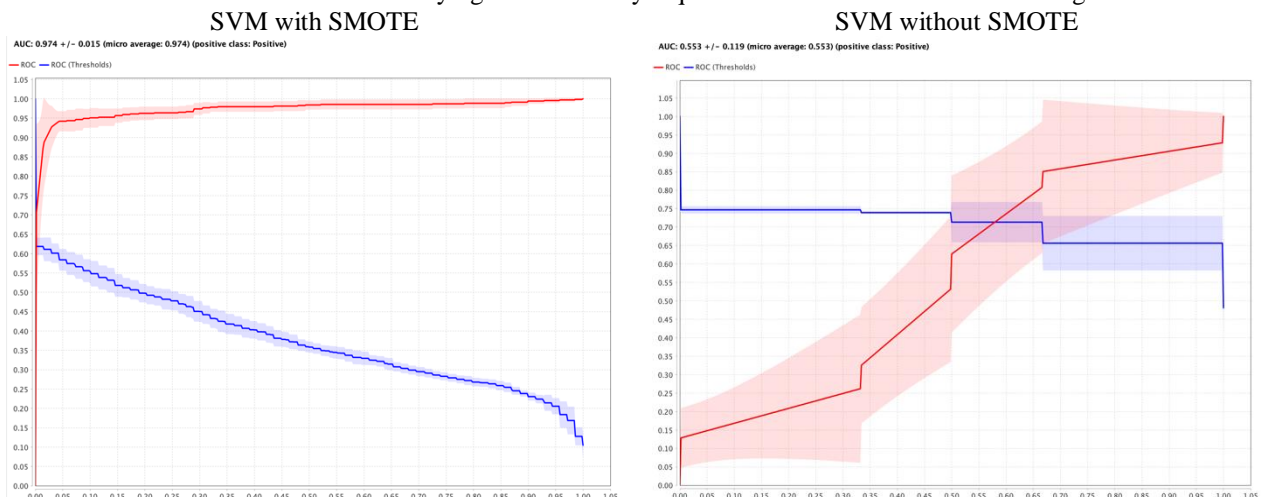


Figure 11. Area Under Curve of SVM

Figure 11 shows the AUC of SVM in sentiment classification. The evaluation results of the SVM performance without SMOTE are as follows: the accuracy is $94.99\% \pm 1.35\%$, with a micro average of 94.99% . The confusion matrix shows one true negative, nine false negatives, 27 false positives, and 682 true positives. The AUC values are 0.728 ± 0.138 (optimistic), 0.553 ± 0.119 , and 0.377 ± 0.185 (pessimistic), all with a micro average matching their respective values for the positive class. Precision stands at $96.19\% \pm 0.67\%$, recall at $98.70\% \pm 1.44\%$, and the F-measure at $97.42\% \pm 0.72\%$, each with a corresponding micro average. These metrics indicate a high-performing model with solid precision and recall, although the AUC suggests some variability in performance across different evaluation scenarios. Consequently, while the model demonstrates excellent classification capability, the variation in AUC values warrants further investigation to enhance the robustness of the model.

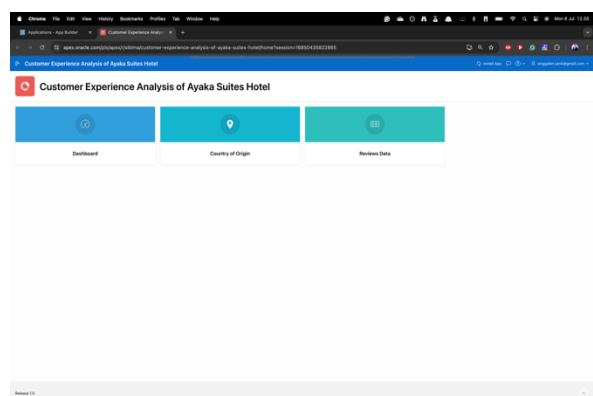
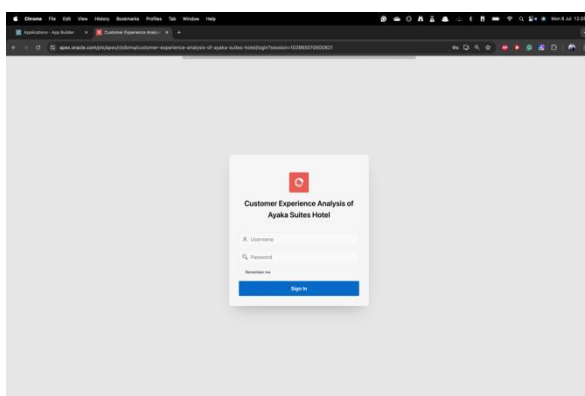
The evaluation results of the SVM performance with SMOTE are as follows: the accuracy is $89.22\% \pm 3.20\%$, with a micro average of 89.22% . The confusion matrix shows 570 true negatives, 28 false negatives, 121 false positives, and 663 true positives. The AUC values are 0.977 ± 0.013 (optimistic), 0.974 ± 0.015 , and 0.971 ± 0.017 (pessimistic), all with a micro average matching their respective values for the positive class. Precision is recorded at $84.87\% \pm 5.14\%$, recall at $95.95\% \pm 1.91\%$, and the F-measure at $89.97\% \pm 2.69\%$, each with a corresponding micro average. These metrics indicate that while SMOTE improves the model's recall and provides a more balanced evaluation across different AUC scenarios, there is a slight trade-off in precision and overall accuracy compared to the model without SMOTE. Consequently, these results suggest that using SMOTE enhances the model's ability to identify positive instances, making it a valuable technique for handling imbalanced datasets.

Table 4. Month and Year of Stay

Month/Year	2016	2016	2017	2018	2019	2020	2021	2022	2023	2024	Grand Total
April			5	20	7			7	29	11	79
August	1		6	1	5			18	17		48
December		20	10	11	7	1	10	36	20		115
February			12	7	4	9	1	1	17	20	71
January			23	9	12	5		6	28	19	102
July			5	4	16			21	14		60
June			8	5	10		2	19	10	11	65
March			12	17	13	4		5	25	19	95
May			5	12	8			24	15	31	95
November			12	6	11	2	3	28	23		85
October			11	10	10	2	2	22	18		75
September			4	5	6	2	3	15	18		53
Grand Total	1	20	113	107	109	25	21	202	234	111	943

Table 4 shows the guest data based on month and year of stay. Several trends can be observed based on the month and year of stay. The most stays occurred in January 2023, with 28 guests, followed closely by December 2022, which saw 36 guests. There has been a notable increase in guest numbers in recent years, particularly from 2022 onwards, reflecting a possible recovery or growth in travel activity. Months such as March, May, and November also show significant guest counts, indicating popular stay periods. The year 2023 stands out with the highest annual total of 234 guests, suggesting a peak in hotel occupancy. Consequently, understanding these trends is essential for optimizing resource allocation and marketing strategies to capitalize on peak travel times and improve overall guest experience.

Based on the visualization results using Oracle APEX, information users can add, delete, or update data as needed. This flexibility allows for real-time adjustments and ensures that the system remains up-to-date with the latest information. The ability to modify data on the fly enhances the accuracy and relevance of the insights generated, thereby supporting more informed decision-making. Additionally, the interactive nature of Oracle APEX facilitates a user-friendly experience, enabling users to manage and analyze data efficiently. Consequently, this adaptability is crucial for maintaining a responsive and effective information system tailored to dynamic business needs.



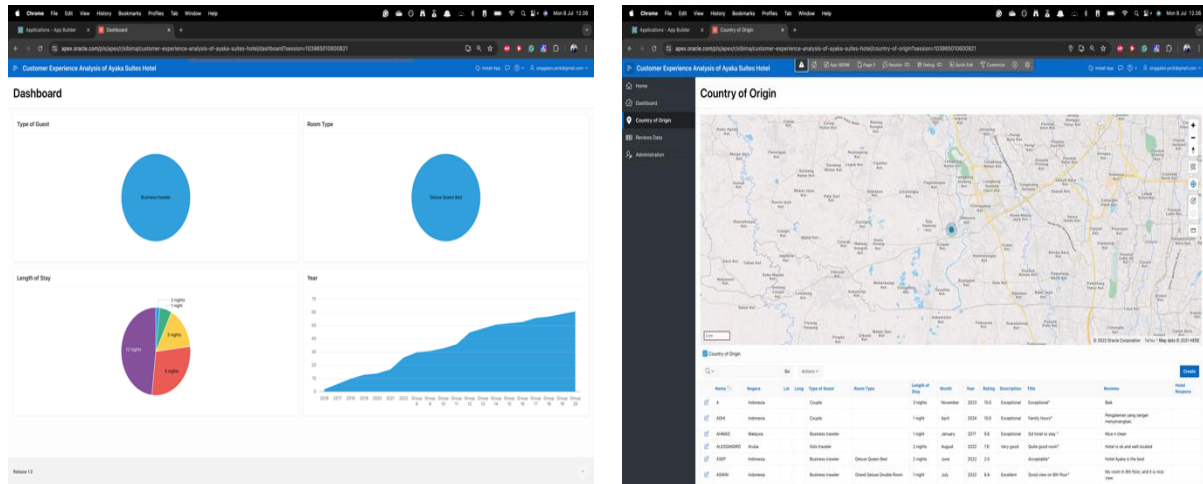


Figure 12. System Design for Customer Experience Analysis

Figure 12 shows the information system design for hotel customer segmentation and analysis. System design for customer experience analysis based on the Ayaka Suites Hotel dataset is essential for optimizing the decision-making process to enhance guest experiences. By tailoring the system to the specific data context of Ayaka Suites, decision-makers can gain precise insights into guest preferences and satisfaction levels. This customized approach enables the identification of critical areas for improvement and the implementation of targeted strategies to elevate service quality. Moreover, an efficiently designed system ensures data is processed and visualized effectively, facilitating swift and informed decisions. Consequently, investing in a well-structured system design is crucial for achieving sustained improvements in customer experience and maintaining a competitive edge in the hospitality industry.

Thus, the CRAF framework is highly relevant for theoretical and empirical contributions. Its structured approach allows for comprehensive analysis and interpretation of customer feedback, providing valuable insights into guest experiences. By systematically categorizing and evaluating data, CRAF facilitates the identification of key trends and areas for improvement, supporting data-driven decision-making. This dual contribution advances academic understanding of customer experience management and offers practical applications for enhancing service quality. Consequently, adopting CRAF is instrumental in achieving meaningful advancements in research and practice.

3.3 Discussion

Customer experience analysis is a critical process for understanding and enhancing guest satisfaction. Businesses can identify key factors that influence the overall customer experience by systematically gathering and evaluating feedback. This analysis helps pinpoint areas of strength and areas needing improvement, enabling targeted interventions that can significantly boost satisfaction and loyalty (Cheong & Law, 2023, 2023; Suleri, Meijer, & Tarus, 2021; Suleri et al., 2021). Moreover, insights gained from customer experience analysis can inform strategic decisions, driving continuous improvement and competitive advantage. Consequently, investing in comprehensive customer experience analysis is essential for fostering long-term success and achieving excellence in service delivery.

A hotel guest experience strategy is essential for ensuring high levels of satisfaction and loyalty among guests. By focusing on critical areas such as personalized service, facility quality, and seamless interactions, hotels can create memorable experiences that exceed guest expectations. Implementing data-driven approaches allows for continuous monitoring and improvement of guest services, ensuring that each stay is better than the last (Cheong & Law, 2023; Quang, Tran, Sthapit, & Garrod, 2024; Thu, 2020, 2020; Wang, 2024; Westerlaken, 2023). Moreover, training staff to be responsive and attentive enhances the guest experience, fostering a welcoming and comfortable environment. Consequently, a well-crafted guest experience strategy is crucial for maintaining competitive advantage and achieving long-term success in the hospitality industry.

Based on the findings of this research, Ayaka Suites Hotel can optimize customer experience through the effective use of digital data. By analyzing guest feedback and reviews, the hotel can identify critical areas that require enhancement, such as service quality, room amenities, and overall guest satisfaction (Cheong & Law, 2023; Suleri et al., 2021, 2021). Integrating data-driven insights enables the hotel to implement targeted strategies that address specific guest preferences and pain points. Additionally, leveraging digital tools for continuous monitoring and assessment ensures that the hotel remains responsive to evolving guest needs. Consequently, utilizing digital data is crucial for Ayaka Suites Hotel to maintain high customer experience standards and achieve sustained success in the competitive hospitality industry.

Thus, CRAF emerges as a highly relevant framework for optimizing customer experience analysis. CRAF provides comprehensive insights into various aspects of the customer journey by systematically categorizing and evaluating guest feedback. This framework identifies critical touchpoints and areas requiring improvement, facilitating targeted interventions. Furthermore, the structured approach of CRAF ensures that data-driven strategies are effectively implemented, enhancing overall guest satisfaction. Consequently, adopting the CRAF framework is crucial for achieving excellence in customer experience management and sustaining competitive advantage in the hospitality industry.

4. CONCLUSION

In conclusion, this research underscores the critical importance of leveraging digital data and structured frameworks like CRAF to optimize customer experience in the hospitality industry. The analysis of 1,028 guest reviews reveals that a significant majority, 987 posts, are positive, while only 40 are negative, indicating overall high satisfaction levels. Additionally, the performance of the SVM model, both with and without SMOTE, highlights its effectiveness in sentiment classification. The SVM model without SMOTE achieved an accuracy of 94.99%, while with SMOTE, it achieved 89.22%, demonstrating the robustness of this approach. Furthermore, deploying the results using Oracle APEX enables creating an interactive information system, providing real-time insights into customer feedback. This system allows for dynamic data management, ensuring the hotel can continuously monitor and adjust its strategies to enhance guest satisfaction. The findings suggest that a comprehensive analysis of guest feedback can identify critical areas for improvement, enhance service quality, and elevate overall guest satisfaction. Implementing data-driven strategies, informed by detailed customer experience analysis, allows hotels such as Ayaka Suites to remain competitive and responsive to evolving guest needs. Therefore, adopting systematic frameworks for customer experience management, complemented by advanced analytical models like SVM and supported by interactive deployment platforms like Oracle APEX, is essential for achieving long-term success and maintaining high standards in service delivery.

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