Temporal Shifts in Customer Sentiment: Analysing Airasia Pre- And Post-Pandemic Reviews

*Sheema Liza Idris
Academy of Language Studies
UiTM Perak Branch
Seri Iskandar, Perak, Malaysia
sheema@uitm.edu.my

Masurah Mohamad
College of Computing, Informatics & Mathematics,
UiTM Perak Branch
Tapah Campus, Perak, Malaysia
masur480@uitm.edu.my

Abstract— **This study thoroughly analyses customer sentiment within AirAsia reviews sourced from Skytrax during two distinct periods: 2017-2019 (pre-pandemic) and 2021-2023 (post-pandemic). AirAsia, a prominent low-cost carrier in Southeast Asia, experienced significant operational changes and customer interactions in response to the COVID-19 pandemic. The research aims to assess how these changes influenced customer sentiments and perceptions using Python language and Valence Aware Dictionary and Sentiment Reasoner (VADER) model. Results showed a trend from predominantly positive pre-pandemic sentiments to more varied and negative post-pandemic sentiments, reflecting concerns about safety, flight disruptions, and service quality. Limitations include potential biases in online reviews and data availability constraints. Future research directions involve exploring deeper contextual factors influencing sentiment shifts and integrating additional data sources for a more comprehensive analysis, offering actionable insights for airlines to enhance service quality and customer experiences amidst crisis events like the COVID-19 pandemic.**

Keywords— Sentiment Analysis, Natural Language Processing, Airline Reviews, Customer Sentiments, COVID-19 Pandemic, AirAsia, Skytrax

I. INTRODUCTION

AirAsia, a major low-cost airline based in Malaysia, has transformed the Southeast Asian aviation market with its affordable fares and extensive route network [1]. However, the COVID-19 pandemic brought unprecedented challenges, causing widespread flight cancellations, travel restrictions, and heightened health concerns, severely impacting air travel demand and operations [2], [3]. The pandemic has reshaped the airline industry, making adaptation and innovation crucial for survival and success in the post-pandemic era [4].

Customer sentiment and satisfaction have become even more critical. Understanding how these sentiments have evolved during the pandemic is vital for airlines to improve service quality and rebuild trust. This study examines AirAsia's customer reviews from before (2017-2019) and after (2021-2023) the pandemic to gauge its impact on customer perceptions and satisfaction.

The research provides valuable insights for AirAsia and the broader airline industry, highlighting the challenges and opportunities arising from shifts in customer behaviour and preferences due to the pandemic. The study aims to enhance the understanding of airline management and customer relations during crises by analysing these changes. It offers practical recommendations for improving service delivery and customer experience, helping airlines navigate the evolving landscape of post-pandemic air travel.

II. LITERATURE REVIEW

A. Sentiment Analysis

Sentiment analysis, also called opinion mining, is a valuable technique for analysing and interpreting sentiments expressed in textual data, such as customer reviews, social media posts, and surveys [5]. This approach utilises natural language processing (NLP) and machine learning algorithms to classify text into positive, negative, or neutral sentiments based on the emotional tone conveyed by the language [6]. In analysing customer feedback, sentiment analysis is critical in understanding customer perceptions, identifying emerging trends, and assessing overall satisfaction levels [7]. By harnessing sentiment analysis, airlines can derive actionable insights to enhance service quality, refine marketing strategies, and elevate customer experiences.

B. Airline Customer Sentiment

Previous research has investigated airline customer sentiments before and after the emergence of the COVID-19 pandemic [8]. These studies have revealed significant changes in customer perceptions and behaviours influenced by external factors such as economic conditions, service disruptions, and safety concerns. For example, [1] examines shifts in customer behaviour during the pandemic, focusing on alterations in travel patterns and safety considerations, while [9] emphasises the impact of medical interventions on restoring passenger confidence. [10] identifies common passenger concerns like quarantines and convenience, with variations based on demographics, highlighting the evolving nature of customer perceptions amid the pandemic.

In airline industry sentiment analysis, various methods have been used to analyse customer feedback. These include lexicon-based approaches, machine learning classifiers, and advanced models like RNNs and BERT. For example, [11] compared Naïve Bayes and Decision Trees using US airline tweets, [12] used word counts, and [13] found that Support Vector Machine effectively categorised tweet sentiments. These techniques help accurately gauge customer sentiments and linguistic trends across different periods and contexts.

C. Global trends in Airline Customer Sentiment

Various factors, including the COVID-19 pandemic, technological advancements, and evolving consumer expectations, have significantly influenced the landscape of airline customer sentiment. Pre-pandemic, the focus was primarily on punctuality, in-flight services, and overall comfort [14,15]. However, the pandemic shifted priorities towards health and safety measures, hygiene standards, and flexibility in booking and cancellations [16].

Moreover, the integration of digital technologies has played an essential role in shaping customer sentiment.

Passengers now expect seamless digital experiences, from easy online booking to efficient self-service options at airports. A study by [17] found that during the COVID-19 pandemic, the response of most travellers to the implementation of new digital technologies by airlines has been positive. Six leading technologies notably contribute to enhancing passengers' satisfaction: AI-powered customer service, electronic baggage tags, cleaning robots, ultraviolet light disinfection, enhanced in-flight entertainment, and access to an electronic library. This adoption of new technologies demonstrates airlines' commitment to innovating for the safety and satisfaction of passengers during these challenging times.

Furthermore, social media and online review platforms have empowered passengers, granting them a significant voice. Consequently, real-time feedback and reviews have become imperative for airlines. In order to excel in a competitive market, the industry must continue to innovate and meet these evolving expectations to improve and sustain customer sentiment.

III. METHODOLOGY

For this study, AirAsia customer reviews were collected from reputable platforms like Skytrax for two distinct periods: 2017-2019 (pre-pandemic) and 2021-2023 (post-pandemic). Skytrax is a well-known platform where travellers share their experiences and rate airlines based on various aspects of service quality, offering a valuable source of customer sentiment data. The reviews gathered covered a wide range of feedback, covering both positive and negative sentiments, enabling a thorough analysis of customer perceptions over time.

Before conducting sentiment analysis, the collected data undergoes a rigorous cleaning process to ensure accuracy and prepare it for analysis [18]. This process involves several steps, including eliminating unnecessary information, dealing with missing data, and standardising the language using text normalisation techniques like stop word removal and word stemming [19]. These steps are essential for refining the data and ensuring its suitability for subsequent analysis.

The data was initially downloaded from https://www.airlinequality.com/airline-reviews/airasia in CSV format, covering 2017 to 2023. However, data from 2020 was excluded due to the lockdown period known as the Movement Control Order (MCO), which severely restricted travel. The analysis used Python, the Valence Aware Dictionary, and the Sentiment Reasoner (VADER) model. VADER calculates sentiment scores based on word usage, classifying phrases as positive or negative depending on their semantic orientation [20].

Sentence-level analysis is performed to classify sentiments and assess polarities. Sentence level classification treats each sentence independently [21]. A polarity check is conducted on subjective texts to categorise them as either "positive" or "negative" based on the sentiment conveyed within the text [22]. Then, the obtained sentiment scores were classified using machine learning algorithms. The Multinomial NB model by Naïve Bayes (NB) and the Support Vector Classification (SVC) model by Support Vector Machine (SVM) have been employed in the training and testing processes. The data was split into 70:30 for training and testing. This thorough approach to

sentiment analysis provides researchers with valuable insights into shifts in customer sentiment towards AirAsia before and after the pandemic, aiding strategic decision-making across different domains such as marketing, product development, and public relations. Fig. 1 summarizes the overall process of conducting the sentiment analysis.
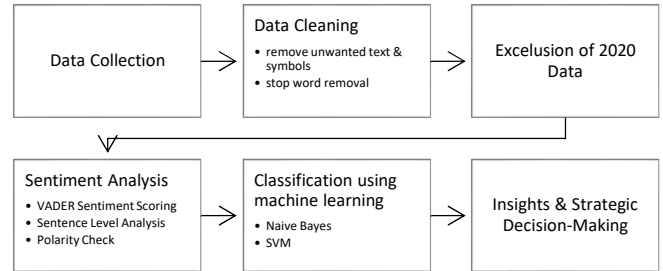

Fig. 1. The research process

IV. FINDINGS

The dataset employed in this study included many AirAsia customer reviews obtained from Skytrax for two distinct periods: 2017-2019 (pre-pandemic) and 2021-2023 (post-pandemic). Specifically, the dataset comprised 269 reviews from the pre-pandemic period and 191 reviews from the post-pandemic period (refer to Fig. 2). These reviews captured a diverse range of customer sentiments, including positive, negative, and neutral feedback, offering a comprehensive foundation for analysing shifts in customer sentiment over time. During the pre-pandemic period, 51.7% was classified as positive sentiment, 47.9% for negative sentiment, and 0.4% for neutral sentiment. In the post-pandemic period, 31.4% was classified for positive sentiment, 68.6% for negative sentiment, and 0% for neutral sentiment

Upon analysing the temporal trends in customer sentiment, noticeable shifts emerged between the pre- and post-pandemic periods. Before the pandemic, customer sentiment was generally positive, with satisfaction focused on AirAsia's affordability and extensive route network. However, post-pandemic sentiment varied, reflecting increased concerns about safety measures, flight disruptions, and customer service quality. This comparative sentiment analysis underscores the pandemic's impact on customer perceptions and the evolving priorities of air travellers in the post-pandemic era.
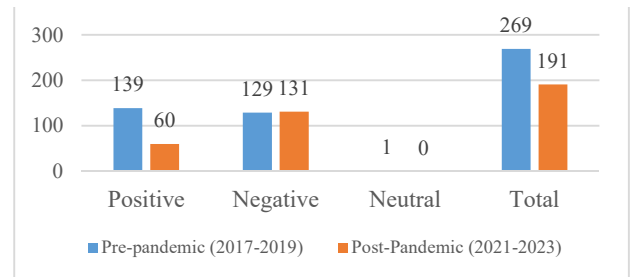

Fig. 2 Comparison between Pre-Pandemic (2017-2019) and Post-Pandemic (2021-2023) for Reviews from Skytrax

Fig. 3 and Fig. 4 demonstrate the word clouds generated for pre and post pandemic reviews. Words like "flight", "seat", "time", "delay", and "late" were some of the highlighted words in Fig. 3 that represent negative and positive reviews. Meanwhile, "refund", "ticket", "luggage",

"hour", and "time" were some of words that appeared in Figure 4 that the Air Asia management could consider for future improvements.

Fig. 3 Word cloud for pre-pandemic reviews.

Fig. 4 Word cloud for post-pandemic reviews.

Table 1 indicates the obtained results of the classification process using Naïve Bayes and Support Vector Machine for pre and post-pandemic datasets. Both algorithms have successfully returned high accuracy rates on pre and post-pandemic datasets.

TABLE I. PERFORMANCE OF NB AND SVM IN THE CLASSIFICATION PROCESS.

Algorithm	Accuracy	Precision	Recall	F1-score
Pre-pandemic				
NB	1.00	1.00	1.00	1.00
SVM	0.99	0.98	0.99	0.98
Post-pandemic				
NB	1.00	1.00	1.00	1.00
SVM	1.00	1.00	1.00	1.00

These high accuracy rates underscore the effectiveness of the sentiment analysis approach used. These combined sentiment lexicons use machine learning classifiers to interpret and classify customer sentiments based on extracted textual features. The precise categorisation of sentiment provided a detailed understanding of customer sentiment dynamics. It yielded actionable insights for AirAsia and the broader airline industry to enhance service quality and address customer concerns effectively.

V. DISCUSSION

This study reveals significant shifts in customer sentiment towards AirAsia before and after the COVID-19 pandemic. Pre-pandemic sentiments were generally positive, with customers appreciating AirAsia's affordability, route network, and service quality. Post-pandemic sentiments, however, fluctuated, with an increased focus on safety measures, flight reliability, and customer service. These shifts reflect evolving priorities in response to pandemic challenges, emphasising the need for airlines to adapt services to meet new expectations.

Several factors influenced these post-pandemic sentiment shifts. Key among them are safety measures implemented to ensure passenger health. Research [23] shows that perceptions of safety and attitudes towards COVID-19 interventions significantly influence travel decisions, with cultural differences playing a role. Additionally, [24] highlights the importance of COVID-19 safety measures and customer sentiments in predicting airline recommendations. Customers now prioritise cleanliness, social distancing, and transparent communication about safety when evaluating airlines.

Flight disruptions and cancellations during the pandemic also impacted satisfaction levels. Studies identify these as primary dissatisfaction sources. [25] suggest that recovery efforts, like compensation and positive employee attitudes, influence customer emotions and satisfaction. Moreover, [26] emphasises that service quality, particularly responsiveness, is crucial for customer satisfaction and loyalty in low-cost carriers. These findings underscore the importance of operational resilience and reliability in shaping customer sentiments, especially during crises.

These insights extend beyond AirAsia to the broader airline industry. Understanding and responding to changing sentiments post-pandemic are crucial for regaining passenger confidence, restoring demand, and driving recovery. For AirAsia, the study highlights the importance of prioritising safety, transparency, and customer-centric enhancements to rebuild trust and loyalty. The findings also provide valuable insights for industry stakeholders navigating the post-pandemic landscape, emphasising the need for proactive measures to address customer concerns and deliver exceptional experiences aligned with evolving expectations in the new normal of air travel.

VI. LIMITATIONS AND FUTURE WORK

This study has limitations that could affect the findings' interpretation and generalizability. Relying on Skytrax reviews may introduce biases from self-selection and subjective opinions, as not all passengers leave reviews. Those who do may have specific experiences or grievances. Focusing solely on written text neglects non-verbal cues from social media posts or surveys.

Future research should integrate additional data sources like social media sentiment analysis and real-time customer feedback. Using qualitative methods such as interviews or focus groups can deepen insights. Advanced techniques like deep learning and contextual embeddings (e.g., BERT) can refine sentiment analysis. Future studies could analyse the impact of AirAsia's service enhancements on customer sentiment. Comparative studies across regions or cultures provide a global perspective on airline customer sentiment, helping to optimise customer satisfaction and service quality in air travel.

VII. CONCLUSION

This study highlights shifts in customer sentiment towards AirAsia before and after the COVID-19 pandemic. Pre-pandemic reviews were primarily positive, praising affordability and route networks. Post-pandemic sentiments were mixed, reflecting concerns about safety, reliability, and customer service, underscoring the need for airlines to adapt to changing expectations.

AirAsia should enhance safety measures and clearly communicate health protocols to rebuild trust and loyalty. Improving operational reliability and minimising flight disruptions are crucial for a better travel experience. Additionally, customer-centric initiatives such as personalised services and responsive support can strengthen passenger relationships and foster loyalty. Adapting to these changing sentiments will help AirAsia succeed in the evolving post-pandemic travel landscape. AirAsia can restore travellers' confidence and drive industry recovery by addressing these areas.

REFERENCES

[1] A. A. U. Tampa, L. Q. Rosli, M. Tahasan, M. 'A. B. Abu Bakar, and R. N. Raja Omar, "Assessing the change in air travelling behaviour patterns during pre and post-pandemic COVID-19 in Malaysia on customer loyalty: The case of AirAsia," in E-Proceeding HOTWEC 6.0, UMK Press, 2022. [Online]. Available: http://hdl.handle.net/123456789/4193.

[2] N. A. Ramli, N. E. Ramli, S. F. Zulkifli, and S. N. A. Ab Wahab, "Aviation businesses during covid-19: AirAsia's financial challenges and possible way-outs," Al-Dzahab, vol. 5, pp. 50-59, 2024. doi: 10.32939/dhb.v5i1.3497.

[3] L. Reddy, R. Vasudevan, Y. Lim, D. Kee, W. Loo, K. Cheah, and S. Mak, "The survival of AirAsia during the COVID-19 pandemic," International Journal of Tourism and Hospitality in Asia Pacific, vol. 4, no. 2, pp. 42-56, 2021. doi: 10.32535/ijthap.v4i2.1058.

[4] D. M. H. Kee, Y. R. Kumar, V. Chadaran, S. Karunakaran, S. Sugumaran, and T. B. Talha, "The struggles and the survival of AirAsia during the Covid-19 pandemic," Advances in Global Economics and Business Journal, vol. 2, no. 1, Universiti Sains Malaysia, Jun. 21, 2021. [Online]. Available: https://agebj.org/index.php/agebj/article/download/23/14/87.

[5] K. L. Tan, C. P. Lee, and K. M. Lim, "A survey of sentiment analysis: Approaches, datasets, and future research," Applied Sciences, vol. 13, p. 4550, 2023. doi: 10.3390/app13074550.

[6] B. Sanzgiri, "The Importance of Customer Sentiment Analysis for Ecommerce Businesses," 42Signals, Apr. 19, 2023. [Online]. Available: https://www.42signals.com/importance-of-customer-sentiment-analysis. [Accessed: Jun. 5, 2024].

[7] N. H. Md Saad, C. San, and Z. Yaacob, "Twitter sentiment analysis of the low-cost airline services after COVID-19 outbreak: The case of AirAsia," Business Systems Research Journal, vol. 14, pp. 1-23, 2024. doi: 10.2478/bsrj-2023-0009.

[8] A. Afaq, L. Gaur, G. Singh, and A. Dhir, "COVID-19: transforming air passengers' behaviour and reshaping their expectations towards the airline industry," Tourism Recreation Research, vol. 48, no. 5, pp. 800-808, 2023. doi: 10.1080/02508281.2021.2008211.

[9] J. Leppävuori, H. Liimatainen, and S. Baumeister, "Flying-related concerns among airline customers in Finland and Sweden during COVID-19," Sustainability, vol. 14, no. 17, p. 10768, 2022. doi: 10.3390/su141710768.

[10] S. Bharatish, N. S. B. Rosmi, N. S. B. M. Shaffee, N. S. B. Hasnuddin, and N. S. B. M. Adnan, "Aviation industry and Covid-19: New normal in the pandemic era, the experience of passenger, post-pandemic traveling, and long-term impact on the airlines," International Journal of Tourism and Hospitality in Asia Pacific, vol. 6, no. 3, pp. 106-119, 2023. doi: 10.32535/ijthap.v6i3.1533.

[11] Z. Iqbal, M. Yadav, and S. Masood, "Implementation of supervised learning techniques for sentiment analysis of customer tweets on airline services," International Journal of Engineering and Applied Science and Technology (IJEAST), vol. 5, no. 3, pp. 351-357, 2020. doi: 10.33564/IJEAST.2020.v05i03.056.

[12] M. J. Adarsh and P. Ravikumar, "An effective method of predicting the polarity of airline tweets using sentiment analysis," in 2018 4th International Conference on Electrical Energy Systems (ICEES), Chennai, India, 2018, pp. 676-679. doi: 10.1109/ICEES.2018.8443195.

[13] A. I. Saad, "Opinion mining on US airline Twitter data using machine learning techniques," in 2020 16th International Computer Engineering Conference (ICENCO), Cairo, Egypt, 2020, pp. 59-63. doi: 10.1109/ICENCO49778.2020.9357390.

[14] J. Hunt and D. Truong, "Low-fare flights across the Atlantic: Impact of low-cost, long-haul trans-Atlantic flights on passenger choice of carrier," Journal of Air Transport Management, vol. 74, pp. 150–159, 2019. [Online]. Available: https://doi.org/10.1016/J.JAIRTRAMAN.2018.12.005

[15] O. Atalik, M. Bakır, and Ş. Akan, "The Role of In-Flight Service Quality on Value for Money in Business Class: A Logit Model on the Airline Industry," Administrative Sciences, vol. 9, no. 1, p. 26, 2019. [Online]. Available: https://doi.org/10.3390/ADMSCI9010026

[16] M. Bielecki, D. Patel, J. Hinkelbein, M. Komorowski, J. Kester, S. Ebrahim, A. Rodríguez-Morales, Z. Memish, and P. Schlagenhauf, "Air travel and COVID-19 prevention in the pandemic and peri-pandemic period: A narrative review," Travel Medicine and Infectious Disease, vol. 39, p. 101915, 2020. [Online]. Available: https://doi.org/10.1016/j.tmaid.2020.101915

[17] Repustate, "Role of data cleaning in sentiment analysis," Feb. 8, 2022. [Online]. Available: https://www.repustate.com/blog/data-cleaning-in-sentiment-analysis/.

[18] S. Idris and M. Mohamad, "A Study on Sentiment Analysis on Airline Quality Services: A Conceptual Paper," Information Management and Business Review, 2023. doi: 10.22610/imbr.v15i4(si)i.3638.

[19] J. Mahreen, "Sentiment analysis using VADER," Analytics Vidhya, Oct. 12, 2022. [Online]. Available: https://www.analyticsvidhya.com/blog/2022/10/sentiment-analysis-using-vader/.

[20] S. Fan, C. Lin, H. Li, Z. Lin, J. Su, H. Zhang, Y. Gong, J. Guo, and N. Duan, "Sentiment-aware word and sentence level pre-training for sentiment analysis," in Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing, Y. Goldberg, Z. Kozareva, and Y. Zhang, Eds., Association for Computational Linguistics, 2022, pp. 4984–4994. doi: 10.18653/v1/2022.emnlp-main.332.

[21] M. Karim, M. M. S. Missen, M. Umer, A. Fida, A. A. Eshmawi, A. Mohamed, and I. Ashraf, "Comprehension of polarity of articles by citation sentiment analysis using TF-IDF and ML classifiers," PeerJ Computer Science, vol. 8, p. e1107, 2022. doi: 10.7717/peerj-cs.1107.

[22] F. Manca, J. Pawlak, and A. Sivakumar, "Impact of perceptions and attitudes on air travel choices in the post-COVID-19 era: A cross-national analysis of stated preference data," Travel Behaviour & Society, vol. 30, pp. 220-239, 2022. doi: 10.2139/ssrn.4106695.

[23] C. K. H. Lee and E. K. H. Leung, "Designing predictive models for customer recommendations during COVID-19 in the airline industry," IEEE Transactions on Engineering Management, 2022. doi: 10.1109/TEM.2022.3211767.

[24] D. Sulu, H. Arasli, and M. B. Saydam, "Air-travelers' perceptions of service quality during the COVID-19 pandemic: Evidence from TripAdvisor sites," Sustainability, vol. 14, no. 1, p. 435, 2022. doi: 10.3390/su14010435.

[25] X. Xu, W. Liu, and D. Gursoy, "The Impacts of Service Failure and Recovery Efforts on Airline Customers' Emotions and Satisfaction," Journal of Travel Research, vol. 58, no. 6, pp. 1034-1051, 2019. doi: 10.1177/0047287518789285.

[26] T. H. Hassan and A. E. Salem, "Impact of service quality of low-cost carriers on airline image and consumers' satisfaction and loyalty during the COVID-19 outbreak," International Journal of Environmental Research and Public Health, vol. 19, no. 1, p. 83, 2022. doi: 10.3390/ijerph1901008.