

Sentiment Analysis for Customer Service

Matthew N. O. Sadiku¹, Paul A. Adekunle², Janet O. Sadiku³

¹Roy G. Perry College of Engineering, Prairie View A&M University, Prairie View, TX, USA

²International Institute of Professional Security, Lagos, Nigeria

³Juliana King University, Houston, TX, USA

ABSTRACT

Customer sentiment analysis (or opinion mining) is a comprehensive approach to understanding customers' emotions, opinions, and attitudes about your brand across all touchpoints. It is a form of data science that uses artificial intelligence (AI), machine learning, and natural language processing (NLP) to analyze customer feedback and customer reviews in real-time from across an organization. It is the process businesses use to understand how customers feel about their products, services, or brand. It is like a digital "mood detector" for customer opinions, helping businesses make smarter decisions. Sentiment analysis in customer experience refers to the data analysis process of understanding and measuring how a customer feels about a particular product, service or brand. Its main goal is understanding a customers' feelings and emotions toward the brand. This paper explores how sentiment analysis impacts customer service.

KEYWORDS: *sentiment analysis, sentimental analysis, opinion mining, customer service, customer service industry.*

INTRODUCTION

Every business conversation revolves around a central question: How do customers feel about us? The answer is sentiment analysis, an advanced tool for analyzing customer feedback that translates customer emotions, opinions, and conversations into actionable insights. Sentiment analysis provides customer service representatives and supervisors with real-time insights into customer interactions with service representatives during conversations. It allows service representatives and supervisors see the customer's satisfaction levels instantly during customer communication [1]. It leverages technology, most commonly artificial intelligence (AI) and natural language processing (NLP), to analyze customer data such as support conversations, online reviews, social media posts, survey responses, and emails. It analyzes the overall sentiment of the text, determining whether it is positive, negative, or neutral. This helps businesses understand the general tone of customer feedback or public opinion.

WHAT IS SENTIMENT ANALYTICS?

Imagine a world where you not only know what your customers are saying, but also how they feel. With sentiment analysis customer service, this dream becomes a reality. Sentiment refers to the overall opinion or attitude. Customer sentiment analysis (or customer sentimental analytics) is the examination of your customers' thoughts and feelings about your brand and the interactions they have with your organization. Customer sentiment (or user sentiment) can be a great indicator of issues in your experiences or service, providing an excellent starting point for action. By understanding customer sentiment, businesses can identify areas for improvement and promptly address any issues or concerns.

Sentiment analysis uses predictive analytics to analyze customer feedback and sentiment from social media, reviews, and surveys. Customer sentiment software uses computational linguistics, such as Natural Language Processing (NLP), to apply machine learning to text and extract insights. For example, IBM Watson employs advanced natural language processing (NLP) and machine learning

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techniques to perform customer sentiment analysis through its Watson Natural Language Understanding (NLU) service [2]. Figure 1 shows customer sentiment analysis process [1].

Sentiment analysis can take many forms, each suited to different business goals. These types are illustrated in Figure 2 [1]. All types rely on measuring the polarity, which shows the overall sentiment in a text. Polarity is usually classified as positive, negative, or neutral. In other words, based on sentiment analytics, customer feedback is typically classified as positive, negative, or neutral, helping companies identify satisfaction levels, pain points, and overall brand perception. More advanced systems also detect emotions like frustration, satisfaction, urgency, or excitement. Positive sentiments are usually expressed with words like “happy,” “good,” “wonderful,” “great,” “recommend,” etc. Words such as “bad,” “hate,” “terrible,” “sucks,” “can’t recommend,” etc. are associated with negative sentiment. Neutral reviews are conveyed with words like “fair,” “average,” “don’t know,” “maybe,” “can’t say,” etc. Figure 3 shows polarity in sentiment analysis [3].

Deducing the specific emotions that your customers are having when they engage with your products will give you insights that will help you make the right decisions. The sentiment behind your customers’ views can drive positive and negative brand reputation. Finding and fixing negative brand sentiment can greatly improve your business’ chances of being recommended. This may involve assigning a numerical score to sentiments, creating a spectrum of emotions instead of binary categories (positive/negative). A very positive comment, for example, could be labeled “+2”, a neutral comment “0” and a very negative comment “-2”.

Typical metrics used to measure customer’s preferences and opinions are lagging quantitative metrics. Customer sentiment, in contrast, can be used in near-real time as a qualitative customer service metric, which can be a leading indicator of critical issues requiring attention. The customer sentiment metric is a brilliant way of understanding customer expectations and delivering incredible customer experiences. It helps organizations to pinpoint customer opinions and feelings about their business, products or services. It allows companies to see if their audience has a positive, negative or neutral view of their experiences. When used in conjunction with analysis of customer emotion, intent, and effort, customer sentiment scoring is a very useful tool for providing better experiences and customer support [4].

SENTIMENT ANALYTICS IN CUSTOMER SERVICE

For decades, businesses have relied on surveys, focus groups, CSAT scores, and anecdotal evidence to gauge customer satisfaction. However, these methods lack scale, speed, and depth. Manual sentiment analysis is a labor-intensive process that requires human intervention to assess each piece of feedback individually. While this method can be useful in small quantities, it quickly becomes impractical as the volume of customer data increases. Traditional sentiment analysis models often struggle with detecting sarcasm, irony, or cultural nuances, leading to misinterpretation of sentiment. As a result, traditional sentiment analysis falls short in delivering reliable insights. AI-powered approaches are changing the game, enabling organizations to unlock deeper insights and respond to customer needs more effectively. AI-powered sentiment analysis relies on several cutting-edge technologies that work together to transform customer feedback into actionable insights. Customer sentiment analysis has become an essential tool for companies looking to gain a competitive edge. Figure 4 shows some customer service team [5], while Figure 5 shows different components of customer sentiment analysis [6].

By doing a sentiment analysis, a business can better understand customer expectations and produce a sentiment score that can be put into practice. Your customers are continually providing you with information about themselves, their wants and their needs. Customer sentiment analysis is basically your customers telling you the truth, whether you ask for it or not. In a world where customers expect brands to get it instantly, sentiment analysis is not a “nice-to-have” anymore, it is how smart teams stay ahead, fix issues faster, and turn everyday conversations into better experiences.

APPLICATIONS OF SENTIMENT ANALYTICS IN CUSTOMER SERVICE

Getting customer sentiment analysis right is about strategy, execution, and staying ahead of the curve. Done well, it transforms raw data into a competitive edge, keeping customers happy and your business thriving. Common areas of application of sentiment analysis in customer service include the following [7,8]:

- *Emotional Intelligence*: Understanding customer emotions is not just a technological achievement; it is the cornerstone of meaningful customer relationships. Modern sentiment analysis has evolved far beyond simple positive-negative classifications into a sophisticated system of emotional intelligence. Through natural language

processing and machine learning, we can now detect subtle emotional undertones in customer communications across all channels, from emails to social media interactions. The application of deep learning networks has reshaped emotional detection granularity. We can now identify complex emotional states such as confusion, hesitation or emerging frustration. This enhanced emotional spectrum allows proactive intervention before issues escalate. Combining emotional intelligence with human empathy results in better customer relationships and strategic business decisions.

- *Cultural Intelligence:* One of the most sophisticated developments in the field is the integration of cultural intelligence into customer sentiment analysis. Modern systems account for cultural differences in emotional expression and communication styles. This capability is particularly crucial in our globalized business environment, where understanding cultural nuances can make the difference between success and failure in customer relationships.
- *Ecommerce:* Understanding customer sentiment is crucial for ecommerce business owners, as it allows them to gain valuable insights into the experiences and satisfaction levels of their customers. Sentiment analysis plays a vital role in improving customer service and driving business growth. By analyzing customer sentiment, ecommerce business owners can gain a deeper understanding of how their customers feel about their products, services, and overall shopping experience. By analyzing customer sentiments expressed in reviews, feedback, and social media posts, ecommerce companies can collect valuable data on what customers love about their products, what improvements they desire, and what features they consider essential.
- *Omnichannel Service:* With the rise of digital platforms, customers now have numerous channels through which they can express their opinions. Customers talk on every channel, such as social media, emails, chats, calls, and reviews. These channels generate vast amounts of unstructured textual data that, when properly analyzed, can provide valuable insights into customer satisfaction. Sentiment analysis, a subfield of natural language processing (NLP), offers a robust approach to extracting and quantifying emotions and opinions from this unstructured text. Omnichannel for customer service helps organizations offer support across multiple channels and engage multiple customers

simultaneously through dedicated sessions. Tracking customer sentiment across multiple channels can be an overwhelming task for human staff.

BENEFITS

Sentiment analysis in customer service offers numerous benefits to businesses. It provides a better understanding of customer satisfaction, enables proactive issue resolution, allows for efficient resource allocation, enhances brand reputation, improves customer experience, and increases customer retention. With insights from customer sentiment, you can find out why your customers are or are not happy directly from them in their own words. You can resolve problems before they affect your bottom line. Other benefits include the following [1,2,4]:

- *Better Customer Service:* Sentiment analysis transforms customer experience strategies by providing real-time insights into customer emotions and needs. It helps businesses identify pain points in customer journeys and personalize interactions. It helps streamline and improve customer service. It enables businesses to detect subtle shifts in consumer preferences. To maintain relevance, companies need to prioritize changes that will have the most significant impact on customer satisfaction. If sentiment analysis shows that consumers are expressing frustration with a competitor's product feature or design flaw, a company can leverage that insight to develop a superior solution, attracting dissatisfied customers from the competition. The advancement of sentiment analysis technology continues to reshape customer service. By driving action from customer sentiment, businesses are able to tackle bad experiences as they happen and transform them into opportunities for neutral or positive sentiment.
- *Ethical Concerns:* As AI grows more powerful, ethical considerations take center stage. Privacy must be ensured without compromising the accuracy of insights. The future of sentiment analysis depends on balancing progress with ethical responsibility, ensuring that as these tools grow more sophisticated, they remain fair and protect user privacy.
- *Privacy Concerns:* As we advance in emotional analysis capabilities, privacy protection becomes increasingly critical. The balance between insight and privacy is essential for maintaining customer trust and compliance with global privacy regulations.

- **Strategic Decision-making:** Sentiment analysis provides actionable insights that inform strategic decisions across a variety of functions. Whether it is marketing, product development, or customer service, sentiment analysis facilitates data-driven decision-making that reduces guesswork and enhances business outcomes.
- **Risk Management:** Tracking sentiment can also help identify risks and protect brand reputation. Brands use customer sentiment analysis for risk management by continuously monitoring customer conversations, reviews, and feedback to detect early signs of dissatisfaction, frustration, or trust issues before they escalate into bigger problems. By spotting these patterns early, companies can intervene proactively and fix issues.
- **Customer Feedback:** Customer feedback refers to information your customers provide about their experience with your brand. Incorporating advanced sentiment analysis into the customer feedback loop enables businesses to refine their approach continuously. By tracking feedback over time, companies can identify evolving tastes, emerging concerns, or unmet needs that provide insights into new opportunities. You can send detailed surveys with open text fields post-interaction to gather feedback from customers that can then be evaluated for customer sentiment. This can assist your team in segmenting your audience more effectively for better targeting down the line. Figure 6 shows customer feedback loop [4]. By using sentiment analytics on all customer interactions, you can begin to see trends that highlight pain points and drivers of sentiment. Your employees are best positioned to turn negative sentiment around and transform bad experiences into positive ones.
- **Personalization:** One of the most direct ways sentiment analysis contributes to improved customer experience is personalization through customer service. Organizations can take the analysis and craft personalized experiences that resonate with individual users, ultimately improving brand reputation and customer loyalty. Instead of offering generic, one-size-fits-all responses, sentiment analysis enables you to understand the tone and emotional state of customers. By acknowledging and addressing the emotional context of the customer's concern, brands can provide a more empathetic and personalized service experience.
- **Reducing Churn:** Churn happens when customers walk away. Sentiment analysis spots the warning

signs early. It flags negative vibes in feedback or chats. That lets you act fast. For example, if reviews show frustration with slow support, you can fix it before they bolt. One-third of customers will quit a brand they love after just one bad experience. Tools like sentiment analysis cut churn by highlighting at-risk accounts.

CHALLENGES

In spite of its advancements and benefits, sentiment analysis faces several challenges. A significant challenge is dealing with the massive amounts of unstructured data generated by customers across digital platforms. Analyzing vast amounts of unstructured text manually is not only time-consuming but also inefficient. Extracting meaningful, emotion-rich insights from vast, unstructured data is a challenge. Customers use varied languages and regional slang, complicating analysis. Other challenges include [3,9]:

- **Limitation:** Traditional sentiment analysis methods are limited in detecting sarcasm. Sarcasm, idiomatic expressions, and context-dependent sentiments are particularly difficult for models to accurately interpret. Language is inherently complex, and traditional sentiment analysis struggles to capture its nuances. Words can change meaning based on context, tone, or how they are used in a sentence.
- **Data Quality:** Tools gather text or voice data from your chosen sources. Train your algorithm with large data sets representing the domain and language you are analyzing. Clean your data to remove noise (such as special characters and irrelevant information) and fix abbreviations. Massive data from social media or chats can overwhelm systems, slowing insights.
- **Bias:** Manual sentiment analysis can be full of human biases. For example, bias enters when assigning scores to sentiments to establish their weight/severity. Skewed training data can misjudge sentiments.
- **Subjectivity:** Sentiment is subjective and can vary from person to person. What one person considers as negative may be neutral or positive to another. Sentiment analysis models do not account for these differences.
- **Nature of Language:** Another significant challenge is the domain-specific nature of language. Human language is messy, full of sarcasm, slang, and subtleties that can trip up even the smartest AI. Words and phrases can carry different sentiments in different contexts. For instance, the word "cold" might have a

negative sentiment in a customer review for a hotel (describing a room temperature) but a positive sentiment in a review for a refrigerator. Recent advances in transfer learning and pretrained language models have shown promise in addressing some of this challenge.

- *Training:* Customer sentiment analytics is an ongoing way in which you can better train your staff. Your team is the front line. Equip them to use sentiment insights effectively. Explain how sentiment scores work. Show agents how to read dashboards.

CONCLUSION

In the fast-paced world of customer service, understanding the sentiments of your customers is no longer a luxury, but a necessity. Figuring out what your customers feel when they engage with your brand can be the difference between business success or failure. Customer sentiment analysis is the process of examining online communication to find out how customers feel about your product or service. It is an integral part of delivering an exceptional AI customer experience. Your customer sentiment analytics software will help you to understand pain points and trends and make predictions for future disruptions. By analyzing language patterns, tone, and context, sentiment analysis allows businesses to gain a comprehensive understanding of their customers' needs, desires, and pain points. Sentiment analysis customer service has emerged as a powerful tool that can unlock valuable insights, revolutionize your customer interactions, and ultimately elevate your business to new heights. It helps you measure customer emotions, giving actionable insight into what to offer to make your customers happy. More information on the integration of sentiment analytics into customer service is available from the books in [10-13].

REFERENCES

- [1] "Complete customer sentiment analysis guide, <https://www.clootrack.com/knowledge/customer-feedback-analysis/the-ultimate-guide-to-customer-sentiment-analysis-of-customer-feedback>
- [2] M. Mehta, "Customer sentiment analysis: Actionable guide for businesses | 2026," March 2026, <https://www.crescendo.ai/blog/customer-sentiment-analysis>
- [3] "Customer sentiment analysis: Ultimate guide to understanding customer emotions," August 2025, <https://www.revechat.com/blog/customer-sentiment-analysis/>
- [4] R. Anderson and D. Pabley, "What is customer sentiment and how do you measure it?" June 2023, <https://www.qualtrics.com/articles/customer-experience/customer-sentiment/>
- [5] R. Walz, "Simple guide on sentiment analysis customer service," December 2023, <https://numerous.ai/blog/sentiment-analysis-customer-service>
- [6] "Customer sentiment analysis: Everything you need to know," <https://surveypal.com/blog/customer-sentiment-analysis-everything-you-need-to-know/>
- [7] "Analyze real-time customer sentiment," <https://learn.microsoft.com/en-us/dynamics365/customer-service/administer/enable-sentiment-analysis>
- [8] J. Iyob, "Customer sentiment analysis: Reading emotions, redefining relationships," <https://www.cmswire.com/customer-experience/customer-sentiment-analysis-reading-emotions-redefining-relationships/>
- [9] N. F. Shaban and R. E. Abolwafa, "Using sentiment analysis to measure customer satisfaction: Model and tool," *International Journal of Cloud Computing and Database Management*, vol.5, no. 1, 2024, pp. 34-37.
- [10] The Art of Service - Sentiment Analysis Publishing, *Sentiment Analysis A Complete Guide*. 5STARCOoks, 2020.
- [11] A. Thulasi, *Sentiment Analysis: Emotional Intelligence in Text: The Sentiment Analyst's Handbook on Techniques and Applications*. Kindle edition, 2023.
- [12] F. Rabby et al. (eds.), *Demystifying Emotion Ai, Robotics Ai, and Sentiment Analysis in Customer Relationship Management*. Engineering Science Reference, 2025.
- [13] J. Mrabet et al. (eds.), *Harnessing Emotion AI for Customer Support and Employee Wellbeing*. IGI Global, 2025.

Customer Sentiment Analysis Process

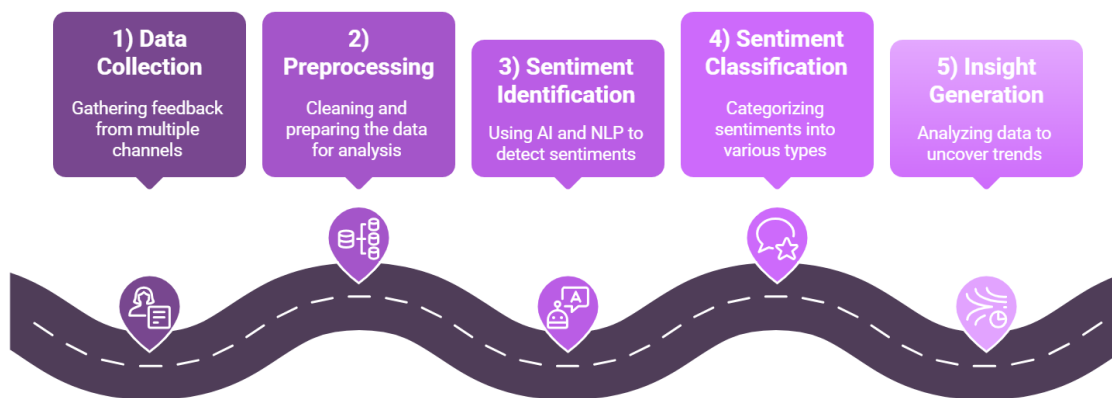


Figure 1 Customer sentiment analysis process [1].

Types of Sentiment Analysis



Figure 2 Types of Sentiment analysis [1].

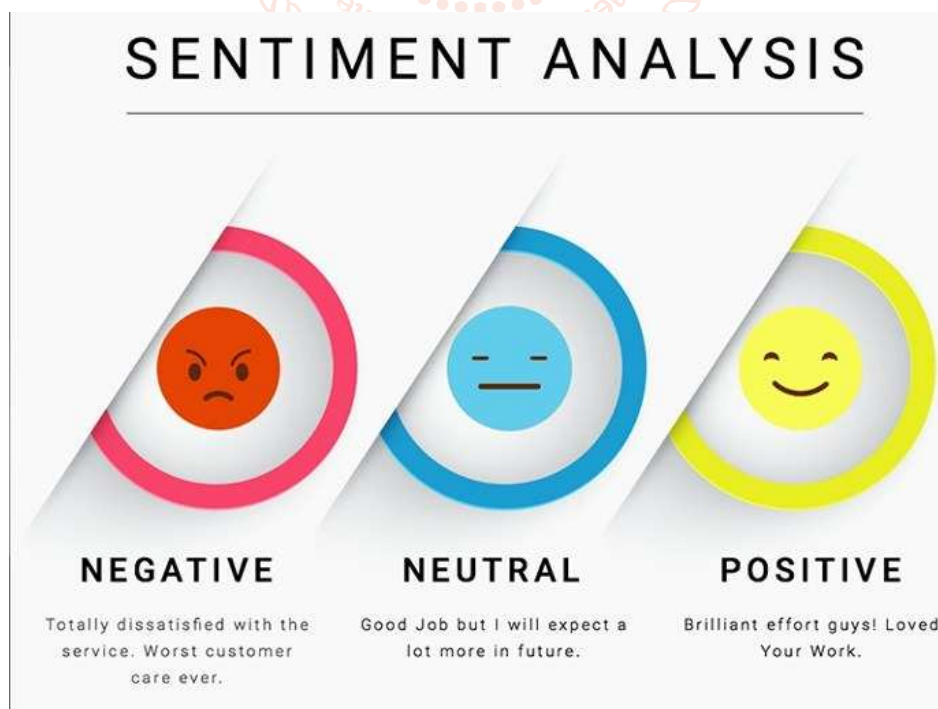


Figure 3 Polarity in sentiment analysis [3].

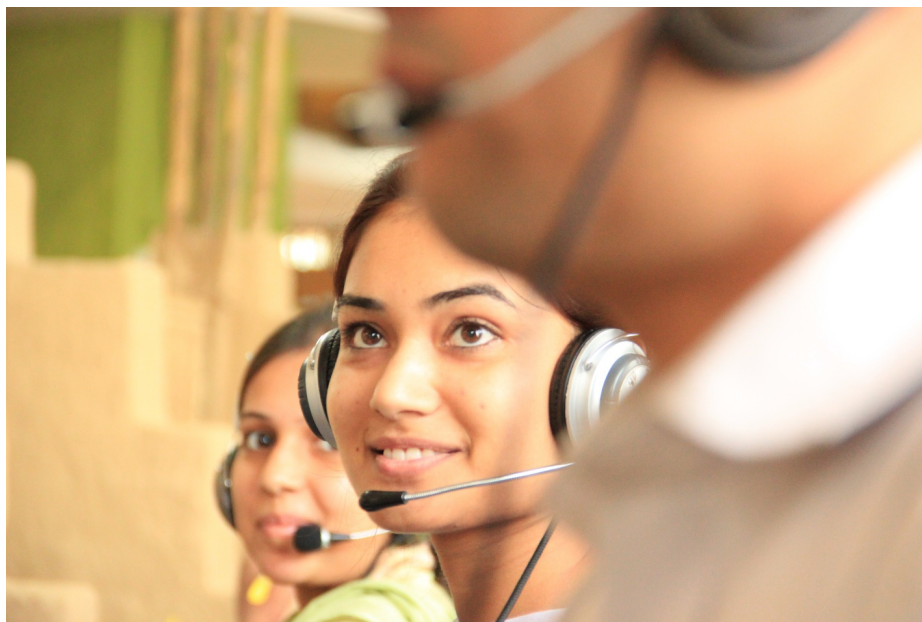


Figure 4 Some customer service team [5].

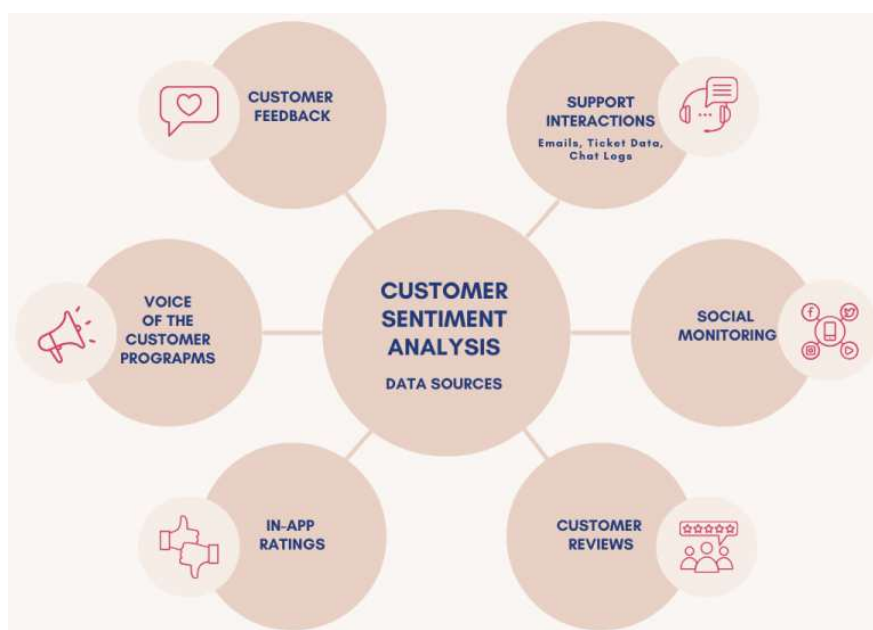


Figure 5 Different components of customer sentiment analysis [6].

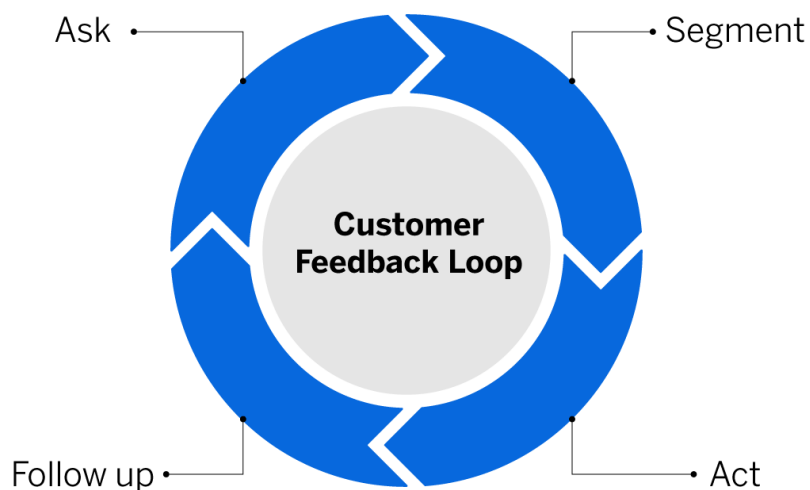


Figure 6 Customer feedback loop [4].