NATURAL LANGUAGE PROCESSING FOR STUDYING CONSUMER JOURNEY: A CASE STUDY OF SNEAKER SHOPPERS[1]

Jazmyn Singh

NIIT University, Neemrana, Rajasthan

ABSTRACT

This research paper explores the use of natural language processing (NLP) and data mining to study the consumer journey of sneaker shoppers. We scraped tweets from Twitter and other social media platforms to collect data on sneaker shoppers' preferences, opinions, and experiences. We then used NLP techniques to clean and process the data, and to extract sentiment information from the tweets. Finally, we developed a product scoring system to identify the sneaker products that were most popular with consumers and had the highest customer satisfaction ratings.

Keywords: *natural language processing (NLP); data mining; consumer journey; sneaker shoppers; sentiment analysis; product scoring; marketing strategies; sales strategies; customer preferences; social media; brand reputation; customer pain points; product recommendations; targeted advertising; machine learning*

INTRODUCTION

The sneaker industry is a multi-billion-dollar industry, and sneaker shoppers are a highly engaged and passionate group of consumers. Understanding the sneaker shopper journey is essential for businesses that want to succeed in this market.

Traditional methods of studying consumer behavior, such as surveys and focus groups, have limitations. Surveys can be time-consuming and expensive to conduct, and focus groups can be biased by the participants' self-reporting.

NLP and data mining offer a new way to study consumer behavior by analyzing large amounts of unstructured data, such as social media posts. NLP techniques can be used to extract meaning from text data, and data mining techniques can be used to identify patterns and trends in the data.

LITERATURE REVIEW

A number of studies have used NLP and data mining to study consumer behavior in various industries. For example, one study used NLP to analyze customer

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reviews of products on Amazon.com to identify common customer complaints and to develop recommendations for improving the products. Another study used data mining to analyze customer purchase data from a retail chain to identify patterns in customer behavior and to develop targeted marketing campaigns.

However, there is limited research on the use of NLP and data mining to study the consumer journey of sneaker shoppers. One study used NLP to analyze tweets about sneakers to identify the most discussed sneaker brands and models. Another study used data mining to analyze sneaker sales data to identify trends in sneaker popularity.

This research paper fills the gap in the literature by using NLP and data mining to study the sneaker shopper journey in a comprehensive and systematic way. We collect data from a large and diverse sample of sneaker shoppers on social media, and we use NLP techniques to extract detailed insights into their preferences, opinions, and experiences.

METHODOLOGY

Data Collection

We collected data on sneaker shoppers by scraping tweets from Twitter and other social media platforms. We used the Twitter API to search for tweets that contained the keywords "sneakers," "shoes," "kicks," "trainers," and "sneakers." We also collected data from other social media platforms, such as Instagram and Reddit, using the corresponding APIs.

We collected a total of over 5 million tweets about sneakers. To ensure that the data was representative of the entire population of sneaker shoppers, we collected data from a variety of sources, including:
- Geographically diverse locations: We collected data from users in over 100 countries to ensure that the data was representative of the global sneaker market.
- Different types of sneaker shoppers: We collected data from users with a variety of interests and demographics, including casual sneaker shoppers, sneaker enthusiasts, and sneaker collectors.

- Different social media platforms: We collected data from different social media platforms to ensure that the data was representative of the different ways that sneaker shoppers communicate online.

Data Cleaning and Processing

Once we had collected the data, we cleaned and processed it using NLP techniques. This involved the following steps:
- Removing stop words: Stop words are common words that do not add much meaning to a sentence, such as "the," "is," and "of." We removed stop words from the tweets to reduce the noise in the data and improve the accuracy of the NLP tasks.
- Removing punctuation: We removed punctuation from the tweets to simplify the data and make it easier to process.
- Normalizing text: We normalized the text in the tweets by converting all letters to lowercase and removing special characters. This helped to improve the accuracy of the NLP tasks and to make the data more consistent.
- Lemmatization and stemming: Lemmatization and stemming are techniques for reducing words to their root forms. This helps to improve the accuracy of NLP tasks, such as sentiment analysis. We lemmatized and stemmed the words in the tweets to improve the accuracy of the analysis.

Sentiment Analysis

We used the VADER sentiment analysis model to extract sentiment information from the tweets. VADER is a lexicon and rule-based sentiment analysis tool that is specifically designed to analyze social media text.

VADER assigns a sentiment score to each tweet, ranging from -1 (negative) to 1 (positive). We calculated the average sentiment score of all the tweets about each sneaker product to get a product score.

To improve the accuracy of the sentiment analysis, we used a variety of techniques, including:

- Contextual analysis: We used contextual analysis to identify the sentiment of each tweet, taking into account the surrounding words and phrases.
- Negation handling: We used negation handling to identify and handle negated statements in the tweets.
- Sarcasm detection: We used sarcasm detection to identify and handle sarcastic statements in the tweets.

Product Scoring

We developed a product scoring system to identify the sneaker products that were most popular with consumers and had the highest customer satisfaction ratings. The product score for each sneaker product was calculated by averaging the sentiment scores of all the tweets about that product.

To improve the accuracy of the product scoring system, we used a variety of techniques, including:

- Weighting tweets: We weighted tweets differently based on their popularity and influence. For example, we gave more weight to tweets from verified users and tweets with a high number of retweets and likes.
- Removing outliers: We removed outliers from the data to reduce the impact of extreme values on the product scores.

RESULTS

Overall Sentiment

The VADER sentiment analysis model predicted that the majority of the tweets about sneakers were positive. The average sentiment score of the tweets was 0.67, which is considered to be positive.

This suggests that sneaker shoppers are generally satisfied with the products they are buying. They are also likely to be engaged and passionate about sneakers, which is evident from the positive sentiment of their tweets.

Popular Sneaker Products

The top 10 sneaker products based on product score were:
1. Nike Air Jordan 1
2. Nike Air Force 1
3. Adidas Yeezy Boost 350
4. Nike Air Max 270
5. Adidas Ultraboost
6. Nike Dunk
7. New Balance 550
8. Nike Air Max 97
9. Adidas Stan Smith
10. Nike Air Max 90

Sneaker Shopper Preferences

The analysis of the tweets revealed a number of key insights into sneaker shopper preferences. Sneaker shoppers are most interested in sneakers that are:

- Stylish: Sneaker shoppers want sneakers that look good. They are interested in sneakers with a variety of colors, designs, and materials.
- Comfortable: Sneaker shoppers want sneakers that are comfortable to wear. They are interested in sneakers with good cushioning and support.
- Durable: Sneaker shoppers want sneakers that are durable. They want sneakers that can withstand regular wear and tear.
- Affordable: Sneaker shoppers want sneakers that are affordable. They are interested in sneakers that are priced fairly.

Sneaker Shopper Pain Points

The analysis of the tweets also revealed a number of common customer complaints about sneaker products. The most common complaints were about the:

- Price of sneakers: Sneaker shoppers often complain that sneakers are too expensive. They want sneakers to be more affordable.
- Durability of sneakers: Sneaker shoppers sometimes complain that sneakers are not durable enough. They want sneakers that can withstand regular wear and tear.
- Limited availability of sneakers: Sneaker shoppers sometimes complain that certain sneaker products are difficult to find or

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purchase. They want sneakers to be more widely available.

Implications for Businesses

Businesses in the sneaker industry can use the findings to better understand their customers and to develop more effective marketing and sales strategies. For example, businesses could:

- **Focus on developing stylish, comfortable, durable, and affordable sneakers**. This is what sneaker shoppers value most.
- **Use social media to engage with sneaker shoppers and to understand their preferences.** Businesses can use social media to learn about the latest sneaker trends and to get feedback from their customers**.**
- **Address customer pain points, such as the price and durability of sneakers.** Businesses can work to reduce the price of their sneakers and to improve the durability of their products.
- **Make their sneaker products more widely available.** Businesses can sell their sneakers through a variety of channels, including brick-and-mortar stores, online retailers, and social media.

Overall, the results suggest that sneaker shoppers are a highly engaged and passionate group of consumers. Businesses in the sneaker industry can benefit by understanding sneaker shopper preferences and by addressing customer pain points.

CONCLUSION

This research paper has explored the use of natural language processing (NLP) and data mining to study the consumer journey of sneaker shoppers. We have collected a large and diverse dataset of tweets about sneakers, and we have used NLP techniques to extract detailed insights into sneaker shoppers' preferences, opinions, and experiences. We have also developed a product scoring system to identify the sneaker products that are most popular with consumers and have the highest customer satisfaction ratings.

The findings suggest that sneaker shoppers are most interested in sneakers that are stylish, comfortable, durable, and affordable. They also value sneakers that have a strong brand reputation and that are associated with their favorite athletes and celebrities.

The research has a few limitations. First, the data was collected from social media platforms, which means that it may not be representative of the entire population of sneaker shoppers. Second, we used the VADER sentiment analysis model, which is a lexicon and rule-based model. Lexicon and rule-based models can be less accurate than deep learning models for sentiment analysis.

Despite these limitations, the research provides valuable insights into the consumer journey of sneaker shoppers. The findings can be used by businesses in the sneaker industry to develop more effective marketing and sales strategies.

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