Transforming Social Media Marketing by Analyzing Weather Patterns and Twitter Activity

Abstract

It has been proven that fluctuations in the weather can greatly influence consumers' emotions, which directly affects their buying behavior and spending patterns. Understanding these patterns and how exactly consumers react to weather conditions is much easier now thanks to social media. Consumers on social platforms share their opinions on almost everything. Companies can now analyze social media activity with the weather to create more relevant marketing strategies, and contextualize promotions and campaigns. Weather data can be used to predict the right time for rolling out social media marketing campaigns to gain a competitive edge and optimize return on investment.
How Consumer Mindset and Weather Impact Marketing Strategy

Social media has completely transformed the marketing landscape. Consumers today are more responsive to recommendations from peers as opposed to conventional advertisements. In fact, 46% of web users look towards social media when making a purchase.

Weather has been shown to be the second-most important influencer of consumer spending. Social media can be the perfect platform to capture the effect of weather on a consumer’s mindset to create weather-responsive campaigns. However, getting the timing right is crucial to success. Customers are most receptive to marketing messages and advertisements for a product when they are discussing that particular product category or deliberating issues that the product or service can solve.

Methodology for Analyzing the Impact of Weather on Twitter Activity

Twitter is one of the most popular social media platforms used by businesses to reach global audiences. Our study focused on measuring the impact of weather on Twitter activity for a specific product category—beer. For this analysis, the tweets were collected from areas within a one mile radius of the capital city of each state in the United States. Regions with the maximum number of tweets in a week containing the search keyword 'beer' were selected. The process followed is described in detail below:

**Step 1: Select the parameters.**

Choose the time period, geographical location, Twitter metrics, weather parameters, and consumer product category. Twitter metrics could be number of tweets, hashtags, retweets, and favorites, and pertain to a particular brand or overall product category. Weather parameters include temperature, precipitation, wind speed, and wind direction.

**Step 2: Connect with the Twitter search API.**

Create a twitter account. Go to dev.twitter.com and log in using the Twitter account credentials and create a new application. It requires a name, description, and website. Create the access token, token secret, API secret, and API key. Connect with the Twitter search API using the access token and API key.
Step 3: Collect tweets using keywords.
Collect tweets through the Twitter Search API with the selected keywords using two filters. The first is related to semantics as defined by a search keyword, chosen based on the level of analysis and the consumer product category. The second filter is the geographical location which includes latitude, longitude, and radius.

Step 4: Collect weather data.
Corresponding weather data from the nearest weather station can be used to build a predictive model to forecast Twitter activity with high levels of accuracy.

Step 5: Add location-specific data to each tweet.
Combine weather data and Twitter data using the time stamp and location as a common key. Each tweet is tagged to the weather data from the weather station nearest to the location of the tweet.

Step 6: Use data modeling and visualization for targeted marketing.
Build a model with Twitter metrics as a dependent variable. Regression methods can be used to model the impact of weather on Twitter activity. The forward selection method is used for obtaining the best fit model for the study. First, simple linear regressions with only one variable are built. The variable with the highest R-squared value is selected. The second variable is selected based on the two-variable model that gives the highest R-squared. This approach is continued until no improvement is observed.

‘Word clouds’ can be used to understand words associated with search keywords. A word cloud enables easy visualization and offers insights into the consumer context behind the consumption of the product or the conversation revolving around it. It can also be used to ensure that the right content is used in advertisements and marketing communications.
Results of Weather and Twitter Activity Analysis

Results from New York

Results showed that the average wind speed had a positive coefficient, implying that as the wind blows faster, people tended to talk more on Twitter. Minimum temperature was inversely related to number of tweets. As temperature lowers, people tend to tweet less about beer.

The tweets gathered are displayed in a word cloud, which indicates that a lot of conversations happened in specific regions such as Queens, Bronx, and New York City. Such information can be leveraged to customize digital content and out-of-home (OOH) advertisements. Beer companies can concentrate on running promotions and discounts in these three locations. According to the analysis, customers from New York are fond of lager beer, while Gun Hill brewery and Finback brewery appeared to be two of the popular breweries where customers liked to socialize. This is crucial information that marketers can use to develop targeted marketing campaigns.
Results from Colorado

The model indicated that if precipitation increases, Twitter activity decreases, and that maximum temperature is inversely related to the number of tweets. As temperature rises, people tend to tweet less about beer. It was also discovered that precipitation levels in Colorado had a greater influence on Twitter activity compared to New York. The above parameters are largely value-based checks that can be integrated into the main accounting system using independent audit tools.

The tweets collected are displayed in a word cloud, indicating a lot of conversations around the word 'brewery'. This can be leveraged to customize advertising and promotions to target customers in breweries.
Conclusion

Today, consumers are tapping into social media several times a day through their mobile devices, across different locations and varied weather conditions. Our analysis shows that weather parameters are directly correlated to the level of social media interactions for a particular product category. Predictive models can be used to set up weather triggers that can initiate advertising campaigns or run promotions at the right time, when customers are talking about the product.

Used intelligently, weather-driven demand triggers on social media offer tremendous opportunity to build brand value, enhance customer relationships, and increase the efficiency and effectiveness of marketing activities.

References


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