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DS 710 Final Project – Executive Summary

Twitter Analysis of Online Shopping Advertisements

Introduction

Do more online shopping advertisements appear on Twitter on Mondays compared to other days of the week, in accordance with online shopping trends? This topic was chosen because of sources stating that most online shopping occurs on Mondays than other days of the week (Zhang, 2017). Through this analysis, one might see if advertisers' online marketing strategies on Twitter fit the customer behavior trend. The original prediction on which this analysis is based is that more advertisements for online shopping will appear on Twitter on Mondays than on other days of the week. The result of the research is interesting for people with online shopping client bases who advertise on Twitter because the test shows how much agreement there is between marketers advertising strategies, and customers' behavior. If there is not much agreement between the advertising strategies and customer behavior, it could indicate that marketers could be more effective by emphasizing ads on Mondays, when customers are in the mood to shop online. Or it could mean that marketers have already determined that to drive customers' purchases on Monday, they need to advertise more on Sunday to put customers in the mood to shop online the next day.

Data Collection

Tweets were collected with Python using REST API from Dec 4th – Dec 10th. Tweets with the hashtag: #onlineshopping were gathered as well as what day of the week they were posted on. This analysis focused on the #onlineshopping because the goal is to target advertisements intended for online shoppers. After gathering all the #onlineshopping tweets, a text classification system was built. This system sorted 150+ tweets into categories of ads or non-ads. Then, the system was used to sort all of the other tweets. After the cleaning of all tweets, there was a total of 5,468 unique tweets that were classified as online shopping advertisements to be further analyzed using R.

Day	Number_Of_Ad	Prop_Ads_Tweets	Prop_Rev
Sunday	666	12.18 %	14.88 %
Monday	841	15.38 %	16.28 %
Tuesday	794	14.52 %	14.53 %
Wednesday	786	14.37 %	14.20 %
Thursday	760	13.90 %	13.75 %
Friday	861	15.75 %	13.55 %
Saturday	760	13.90 %	12.81 %

Figure 1 - Compares day, Number of ads from Twitter, Probability of ads on Twitter, and Probability of online shopping revenue by day from Zhang research.

Analysis

First, a Chi-Squared Goodness of Fit Test was performed, which assumes that the proportion of the data from "Average Daily Revenue by Day of the Week"[1] is a good fit for the data collected on Twitter. At the significance level of 0.01 (p-value = 6.6e-10), the null hypothesis was rejected. There is sufficient evidence to claim that at least one of the proportions in the dataset is different than in the Zhang article. These proportions can be seen in the table (Figure 1).

[1] Zhang, J. (2017, August 01). Trends: When Do People Shop Online? Retrieved December 04, 2017, from https://www.workarea.com/blog_entries/trends-when-do-people-shop-onlineupdated-for-2017

Although the proportions of ads for each day are different from the proportions found in the article, a one-sample test of proportions was performed to further confirm if most of the advertisements on Twitter were posted on Friday. This test compares the proportion of tweets on Friday to Monday. A two-sided alternative test was used to find out if Friday or Monday was most likely to have the most advertisements. According to this test, with the significant level of 0.01 (p-value = 0.6451), there is not enough evidence to claim that the majority (>0.50) of tweets were tweeted on Friday compare to Monday. Figure 2 shows the proportion of ads posted by marketers on Twitter each day. Monday had 15.38% of advertisements related to online shopping and was the second highest in the week.

Conclusion

To conclude, the online shopping advertisements that appear on Twitter on Mondays are not corresponding with the online shopping trends found in Zhang's data. Marketers on Twitter may consider increasing their number of advertisements on Mondays to fit the data from Zhang's findings on consumer trends.

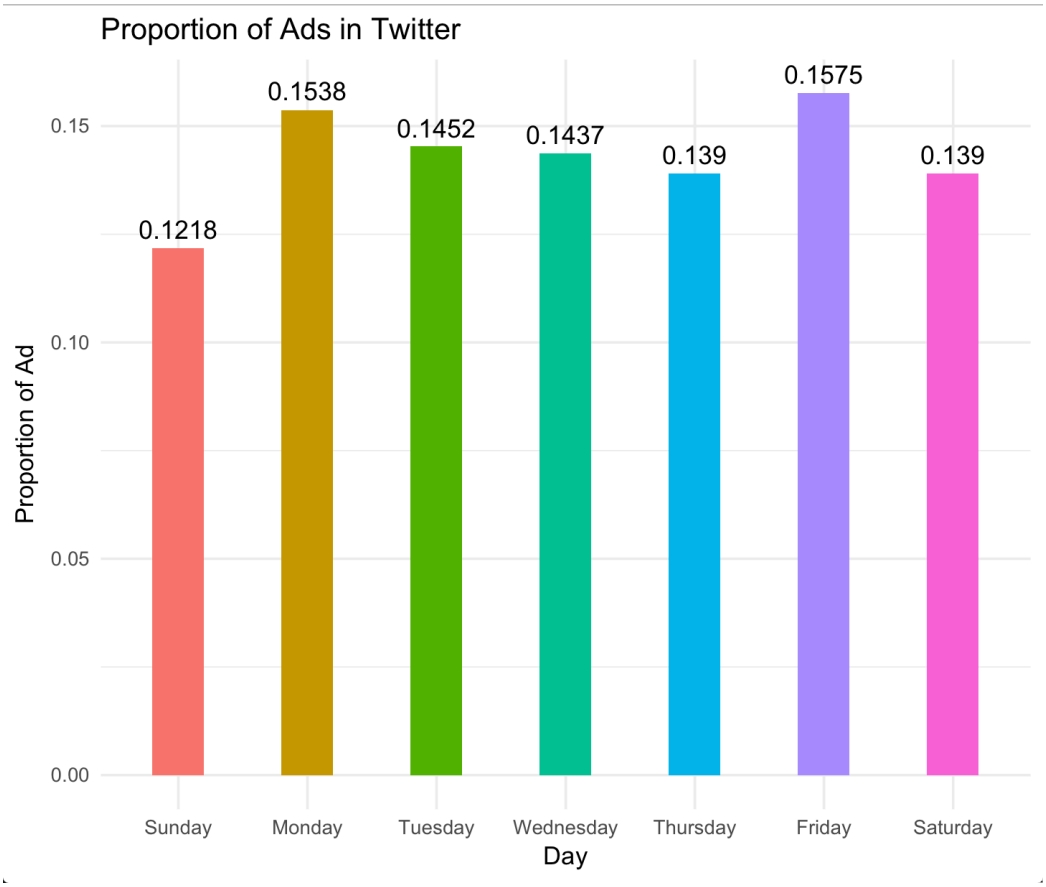

Figure 2 - Proportion of Advertisements on Twitter by Day.