Retail Foot Traffic & Business Success

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Business Question:

How does retail foot traffic influence business performance and longevity?

Hypotheses

1. Businesses grow in popularity on yelp - *meaning they receive more reviews* - as a result of increased local retail foot traffic.

2. Businesses tend to close more often during the winter than other seasons, as a result of decreased retail foot traffic.

3. A business category with high average retail foot traffic results in more reviews and longer business longevity.

Yelp Data Overview (Primary Data Source)

Overview: contains data on businesses, the category that business is under, information about users, and information about reviews

Timeline (review table): 2/16/05 → 1/19/22

Applicable:

Business table (including 'business_id', 'city', 'state', 'postal_code', 'stars', and 'review_count')

Category table (including 'business_id' and 'category_name')

Review table (including 'business_id' and 'review_date')

Retail Foot Traffic Data Overview (Secondary Data Source)

Overview: contains the average retail foot traffic over a 15 minute period, specifying the state, location description, and timestamp of each 15 minute period (datetime)

Timeline: 1/1/18 → 9/13/22

Applicable:

Retail Foot Traffic Data (including 'state', 'foot_traffic_count_normalized', 'number_of_locations_description', 'timestamp')

Variable Calculations and Data Filtering

— Data Filtering —

Yelp: (2/16/05 → 1/19/22)
RFT: (1/1/18 → 9/13/22)

Final Dates (1/1/18 → 1/19/22)

RFT data only from 6 am to 10 pm

Final State List
('CA','MO','AZ','PA','TN','FL','IN','LA','AB','NV','ID','DE','IL','NJ')

Final Category list
Events, Automotive, Hotels & Travel, Food, and Health & Medical

— Calculated Variables —

The yelp is_open column is not accurate, as expressed in the "Yelp Data Exploration with SQL.docx"

closing date: day of last review
(w/n yelp review data, not the filtered date range - ignored closing dates in Jan 2022 to avoid the end of the datafile skewing results)

opening date: day of first review

business longevity: opening date to closing date in days

season closed (season):
Winter (12/22 → 3/19)
Spring (3/20 → 6/19)
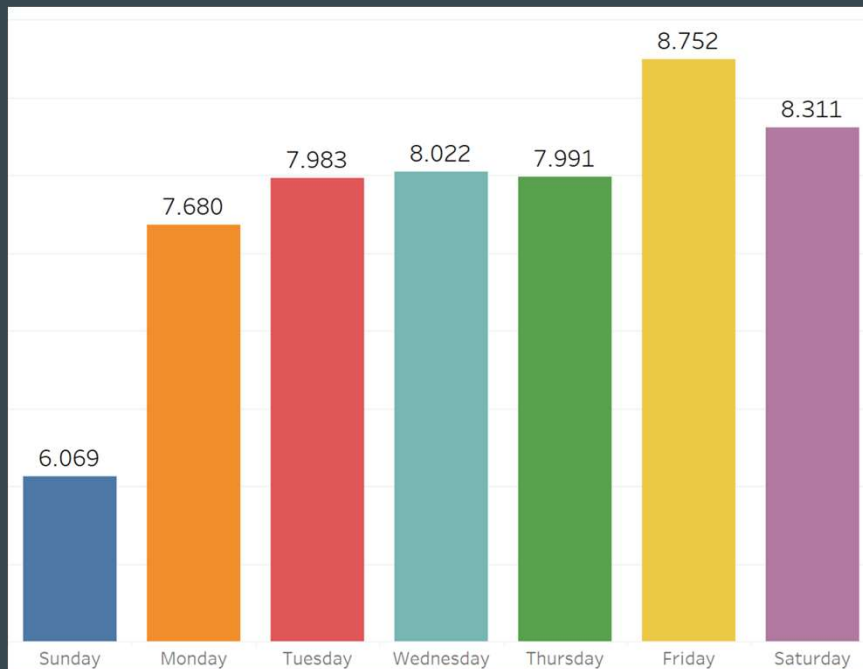Summer (6/20 - 9/21)
Fall (9/22 → 12/21)

RFT Effect on Review Count

Businesses grow in popularity on yelp - meaning they receive more reviews - as a result of increased local retail foot traffic.

# RFT effect on reviews (reviewCount) and day of week (DOW)

RFT

Takeaway

Customers tend to shop more towards the end of the week, with the peak on friday. Sunday see a large decrease in foot traffic.

RFT effect on reviews (reviewCount) and day of week (DOW)

Takeaway

Customers tend to place reviews on the weekend, peaking on Sunday. Customers place reviews the least on Thursdays.
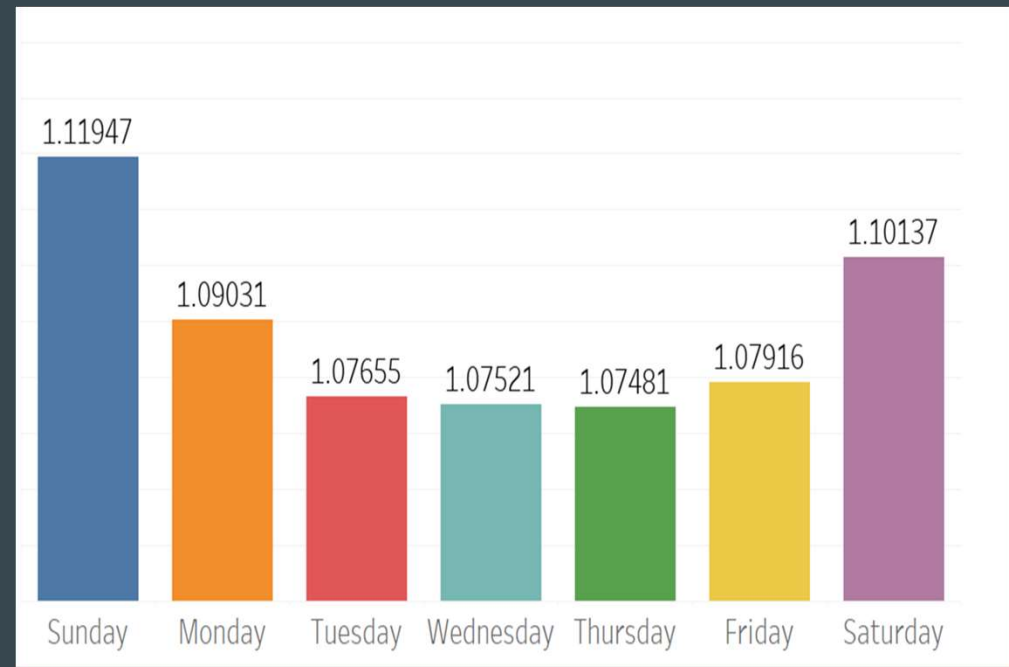
Review Count

Main Takeaways and Conclusion

Takeaways

> Customer behavior: customers tend to shop the most towards the end of the week, with retail foot traffic peaking on friday - and seeing a large decline on Sunday. Customers then tend to place reviews on the weekend, peaking on sunday

Updated Hypothesis and Conclusion

> Businesses grow in popularity on yelp - meaning they receive more reviews - as a delayed result - roughly a day - of increased local retail foot traffic.

RFT Effect on Closing Season

Businesses tend to close more often during the winter than other seasons, as a result of decreased retail foot traffic.
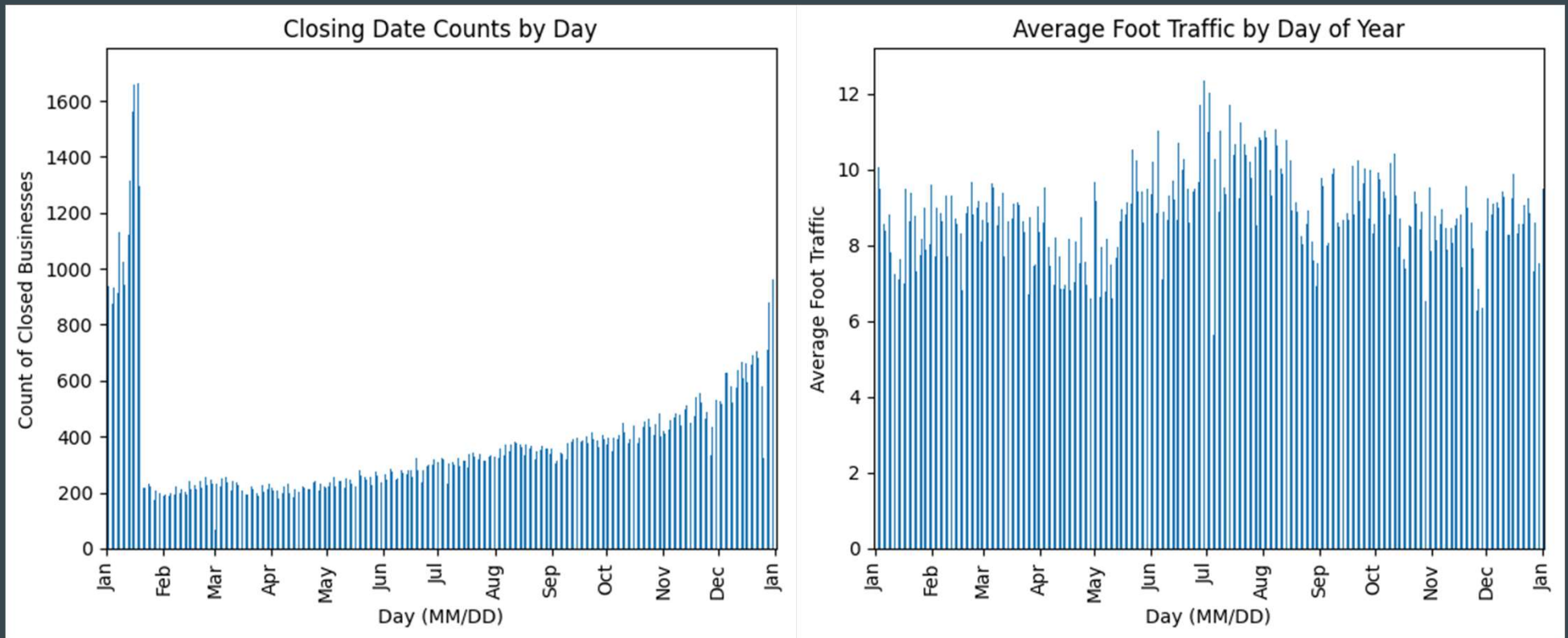
RFT Effect on Closing Season

Business ID Counts Closed by Season
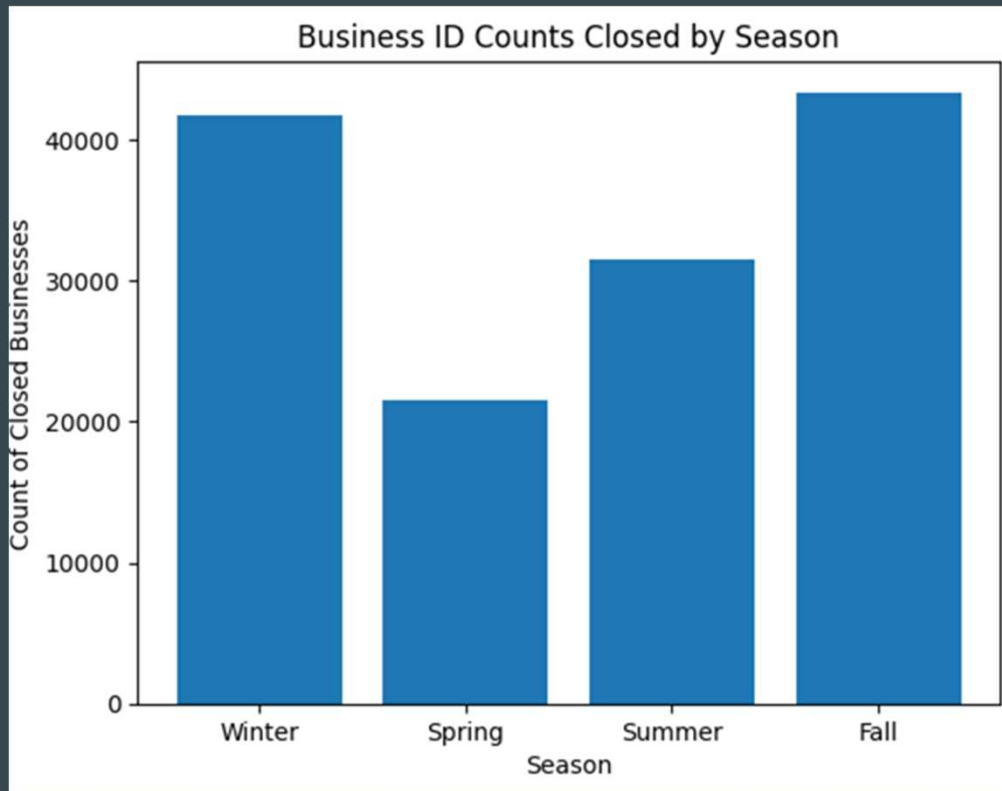
Takeaway

Businesses appear to close the most often during the colder months, with the peak in fall and winter. The spring has the lowest amount of closings.
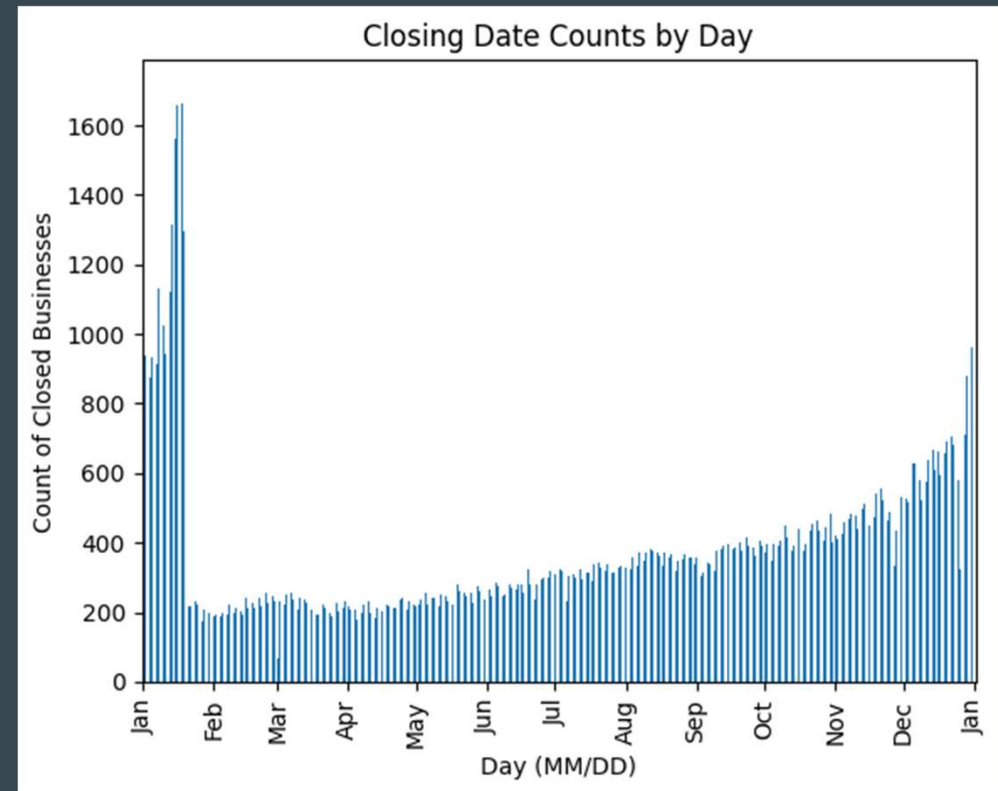
RFT Effect on Closing Season

RFT Effect on Closing Season

Takeaway

Businesses have a dramatic shift in business closings in the winter and peaking into the middle of January.

Retail foot traffic seems to peak in the winter for the holidays and in the middle of the summer, however this has no correlation with the closing dates.

Closing Date Counts by Day

Main Takeaways and Conclusion

Takeaways

Business Behavior: No discernible correlation between average foot traffic and closing dates. With closing dates rising and peaking in the winter months, followed by a dramatic decrease in business closings in the middle of January.

Updated Hypothesis and Conclusion

Businesses tend to close more often during the winter than other seasons, seemingly not as a result of retail foot traffic - likely instead correlated with the end of the fiscal year.
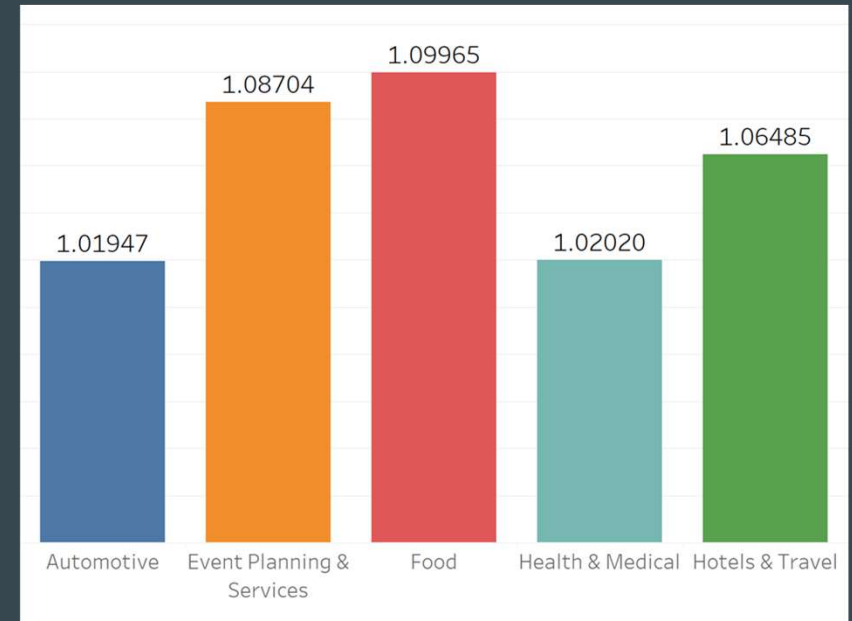
RFT Effect on Reviews and Longevity

A business category with high average retail foot traffic results in more reviews and longer business longevity.

RFT Effect on Reviews by Category

RFT

Bar chart values (RFT):
- Automotive: 8.0383
- Event Planning & Services: 7.8069
- Food: 7.7995
- Health & Medical: 7.9205
- Hotels & Travel: 7.4561

Review Count

Bar chart values (Review Count):
- Automotive: 1.01947
- Event Planning & Services: 1.08704
- Food: 1.09965
- Health & Medical: 1.02020
- Hotels & Travel: 1.06485

Takeaway

Category Behavior: RFT seems to have very little correlation with the amount of reviews a category receives. The automotive industry for example has the highest rft on average but the lowest review count.
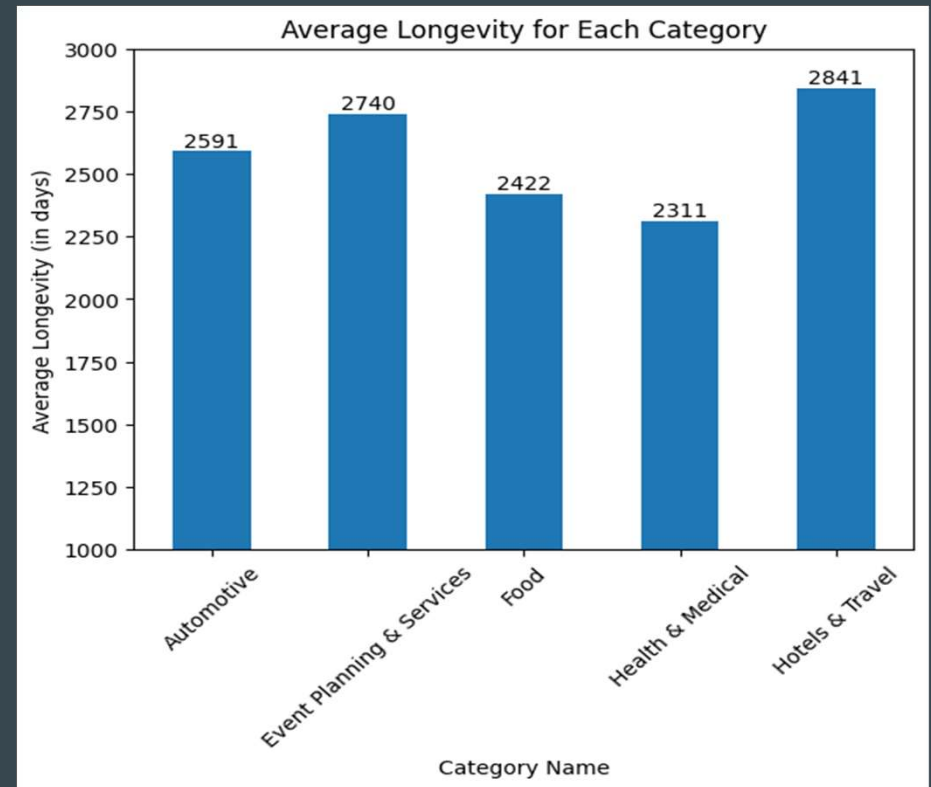
Business Longevity (Closing Rates)

Takeaway

Average longevity is higher in Hotels & Travel and Event Planning & Services.

Average longevity is lowest in Food and Health & Medical.

Although there are differences Average longevity is relatively similar across the categories ranging from 2000-3000 days.

Main Takeaways and Conclusion

Takeaways

Category Behavior: There isn't a huge difference across RFT rates between categories. Review counts and longevity don't seem to correlate with foot traffic behavior.

Updated Hypothesis and Conclusion

A business category with high average retail foot traffic does not result in more reviews and longer business longevity. There are likely other business factors that impact these averages.

Key Takeaways and Learnings from the Project

Businesses grow in popularity on yelp - meaning they receive more reviews - as a delayed result - roughly a day - of increased local retail foot traffic.

Businesses tend to close more often during the winter than other seasons, seemingly not as a result of retail foot traffic - likely instead correlated with the end of the fiscal year.

A business category with high average retail foot traffic does not result in more reviews and longer business longevity. There are likely other business factors that impact these averages.

Challenges Faced & Recommendations for Further Research

Challenges Faced

-   Json data set, harder to query - required more complicated sql code

Recommendations for Further Research

-   Track retail foot traffic individually by category instead, and at a city or county level (rather than state level)
-   Receive actual business closing dates and longevity numbers, as the review dates are likely off by a few days or weeks
-   Correlation does not imply causation, further statistical analysis should be done to validate meaningful conclusions