

ENHANCING RESTAURANT SUCCESS THROUGH USER ENGAGEMENT ANALYSIS

A Report by Parshant Vijay

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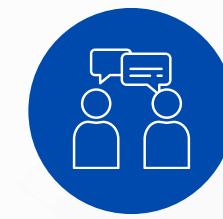
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PROBLEM STATEMENT

IN THE COMPETITIVE RESTAURANT INDUSTRY, IT'S IMPORTANT TO UNDERSTAND WHAT MAKES A RESTAURANT SUCCESSFUL.

THIS PROJECT USES DATA FROM YELP TO LOOK AT HOW THINGS LIKE REVIEWS, TIPS, AND CHECK-INS FROM CUSTOMERS RELATE TO A RESTAURANT'S REVIEW COUNT AND RATINGS.



RESEARCH OBJECTIVES

- QUANTIFY THE CORRELATION BETWEEN USER ENGAGEMENT (REVIEWS, TIPS, CHECKINS) AND REVIEW COUNT/AVERAGE STAR RATING
- ANALYZE THE IMPACT OF SENTIMENT ON REVIEW COUNT AND AVERAGE STAR RATING
- TIME TRENDS IN USER ENGAGEMENT



HYPOTHESIS TESTING

- HIGHER LEVELS OF USER ENGAGEMENT (MORE REVIEWS, TIPS, AND CHECKINS) CORRELATE WITH HIGHER REVIEW COUNTS AND RATINGS FOR RESTAURANTS.
- POSITIVE SENTIMENT EXPRESSED IN REVIEWS AND TIPS CONTRIBUTE TO HIGHER OVERALL RATINGS AND REVIEW COUNTS FOR RESTAURANTS.
- CONSISTENT ENGAGEMENT OVER TIME IS POSITIVELY ASSOCIATED WITH SUSTAINED BUSINESS SUCCESS FOR RESTAURANTS.



DATA OVERVIEW

- THE DATASET IS A SUBSET OF YELP AND HAS INFORMATION ABOUT BUSINESSES ACROSS 8 METROPOLITAN AREAS IN USA AND CANADA.
- THE ORIGINAL DATA IS SHARED BY YELP AS JSON FILES
- THE FIVE JSON FILES ARE BUSINESS, REVIEW, TIP, USER AND CHECKIN
- THE JSON FILES ARE STORED IN THE DATABASE FOR EASIER RETRIEVAL OF DATA.



ANALYSIS & FINDINGS

- OUT OF 150K BUSINESSES, 35K ARE RESTAURANTS BUSINESSES AND ARE OPEN.
- TABLE SHOWING DISTRIBUTION OF BUSINESS SUCCESS METRICS (REVIEW COUNT AND AVERAGE RATING)

AvgReviewCount	MinReviewCount	MaxReviewCount	MedianReviewCount	AvgStars	MinStars	MaxStars	MedianStars
104.097789	5	7568	15	3.523969	1.0	5.0	3.5



HIGHEST RATINGS

BusinessName	review_count	AvgRating
â café	48	5.0
two birds cafe	77	5.0
the brewers cabinet production	13	5.0
taqueria la cañada	17	5.0
la bamba	44	5.0
la 5th av tacos	24	5.0
el sabor mexican and chinese food	21	5.0
eat.drink.Om...YOGA CAFE	7	5.0
d4 Tabletop Gaming Cafe	8	5.0
cabbage vegetarian cafe	12	5.0

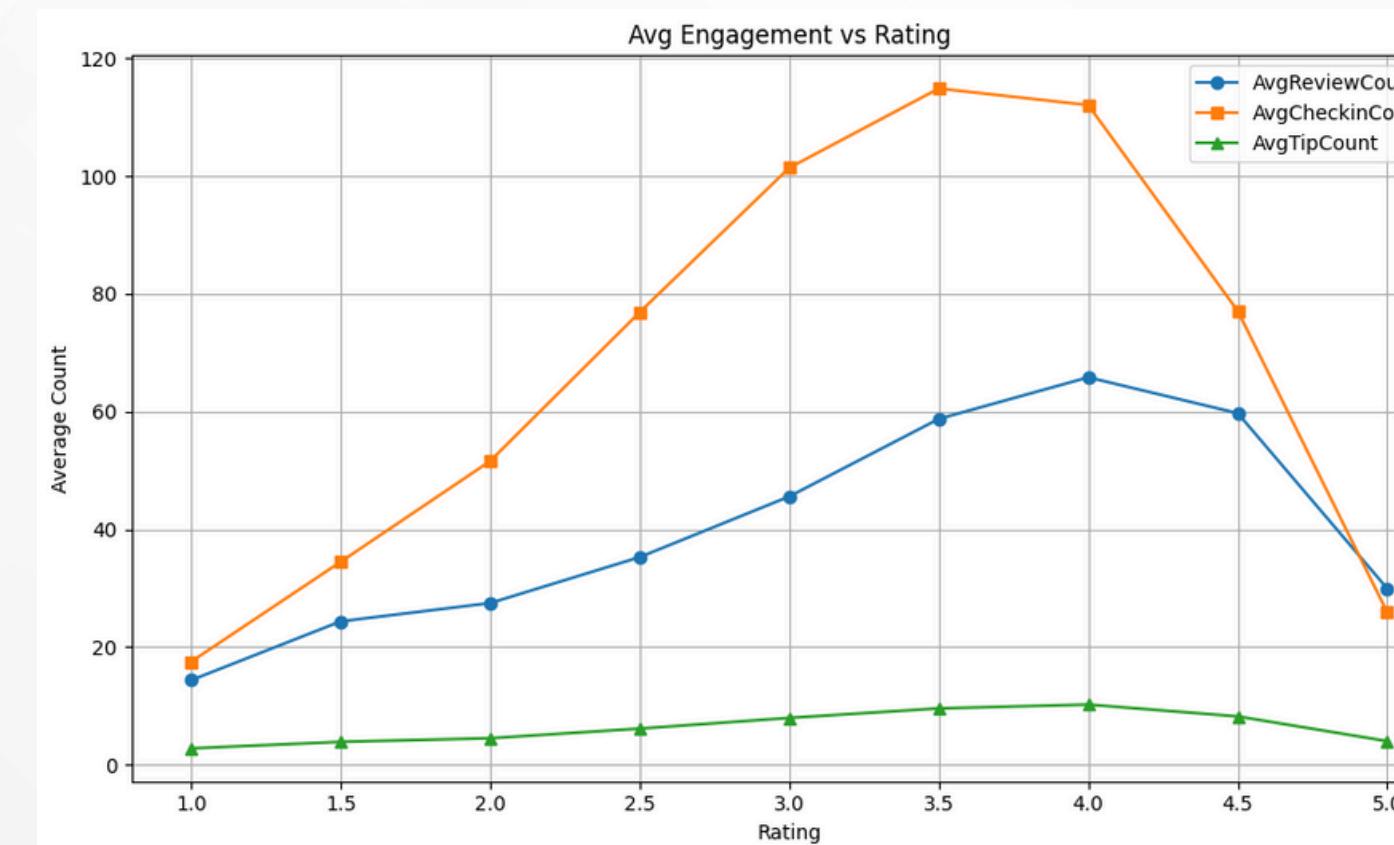
HIGHEST REVIEW COUNT

BusinessName	review_count	AvgRating
McDonald's	16490	1.868702
Chipotle Mexican Grill	9071	2.381757
Taco Bell	8017	2.141813
Chick-fil-A	7455	3.373377
Panera Bread	6613	2.661905
Buffalo Wild Wings	6253	2.350877
Domino's Pizza	6091	2.290210
Wendy's	5930	2.030159
Chili's	5744	2.514706
Applebee's Grill + Bar	5515	2.534314

- Higher ratings do not guarantee a higher review count, or vice versa.
- Success of Restaurants is not solely determined by ratings or review counts.
- Review count reflects user engagement but not necessarily overall customer satisfaction or business performance.

DO RESTAURANTS WITH HIGHER ENGAGEMENT TEND TO HAVE HIGHER RATINGS?

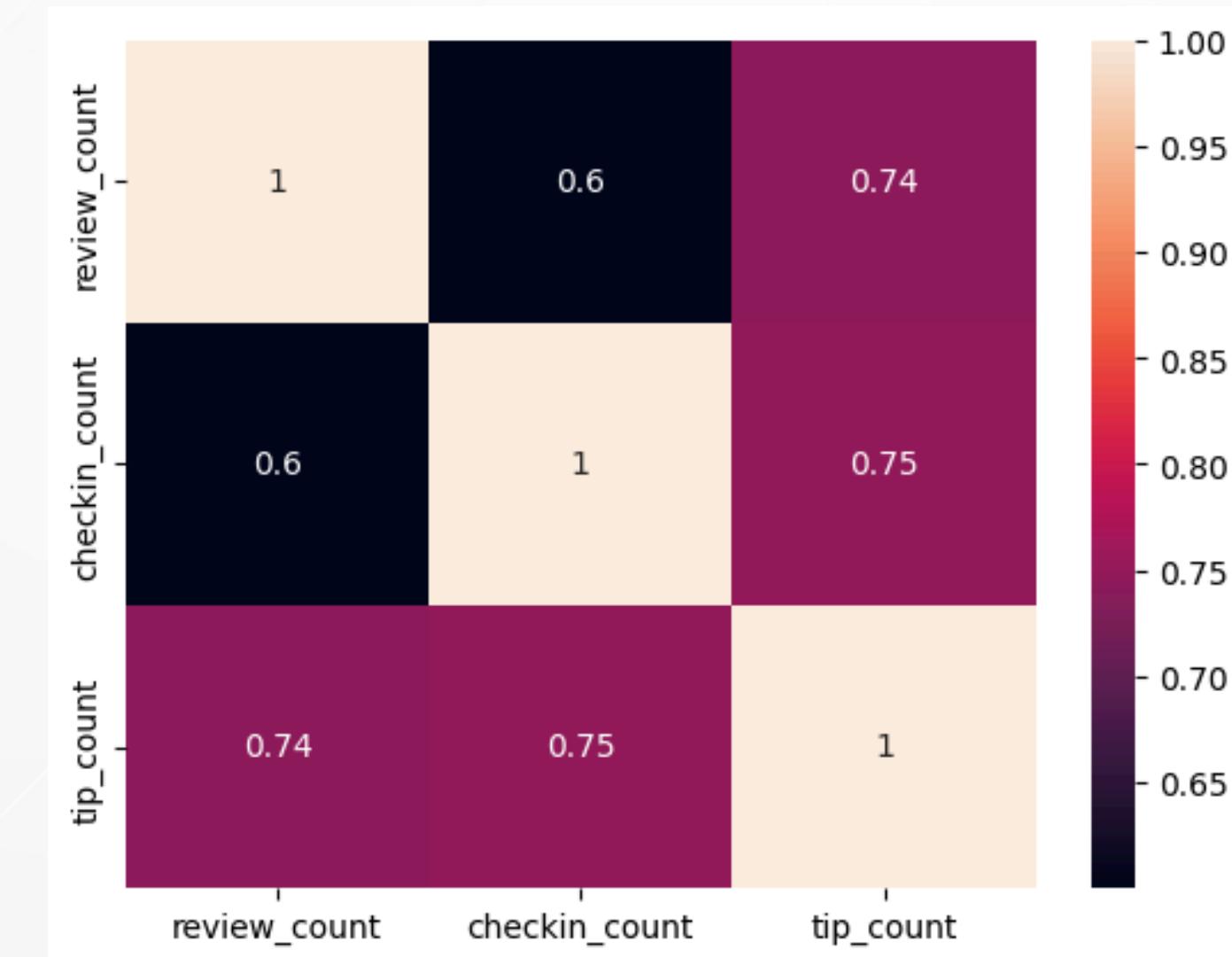
- Data shows a general increase in average reviews, check-ins, and tip counts as ratings improve from 1 to 4 stars.
- Restaurants rated 3.5 stars exhibit the highest engagement levels.
- Engagement shows a downward trend above 4 stars.
- The drop in engagement at 5.0 stars might suggest:
 - A saturation point where fewer customers feel compelled to add reviews.
 - Selectivity, where only a small, satisfied audience frequents these establishments.





IS THERE A COORELATION BETWEEN THE NUMBER OF REVIEWS, TIPS, AND CHECK-INS FOR A BUSINESS?

- User engagement across various platforms (reviews, tips, check-ins) shows interconnections; higher activity in one area correlates with increased activity in others.
- Businesses should prioritize strategies that enhance all types of user engagement.
- Improvements in one engagement type are likely to positively influence others.
- This approach can significantly boost overall visibility and customer interaction.





IS THERE A DIFFERENCE IN THE USER ENGAGEMENT BETWEEN HIGH-RATED AND LOW-RATED BUSINESSES?

- There is a clear correlation between higher ratings and increased user engagement across reviews, tips, and check-ins.
- This pattern underscores the importance of maintaining high service and quality standards, as these factors drive more reviews, check-ins, and tips.
- Reviews, check-ins, and tips are critical metrics of customer engagement and satisfaction, reflecting the impact of service and quality on customer interactions.

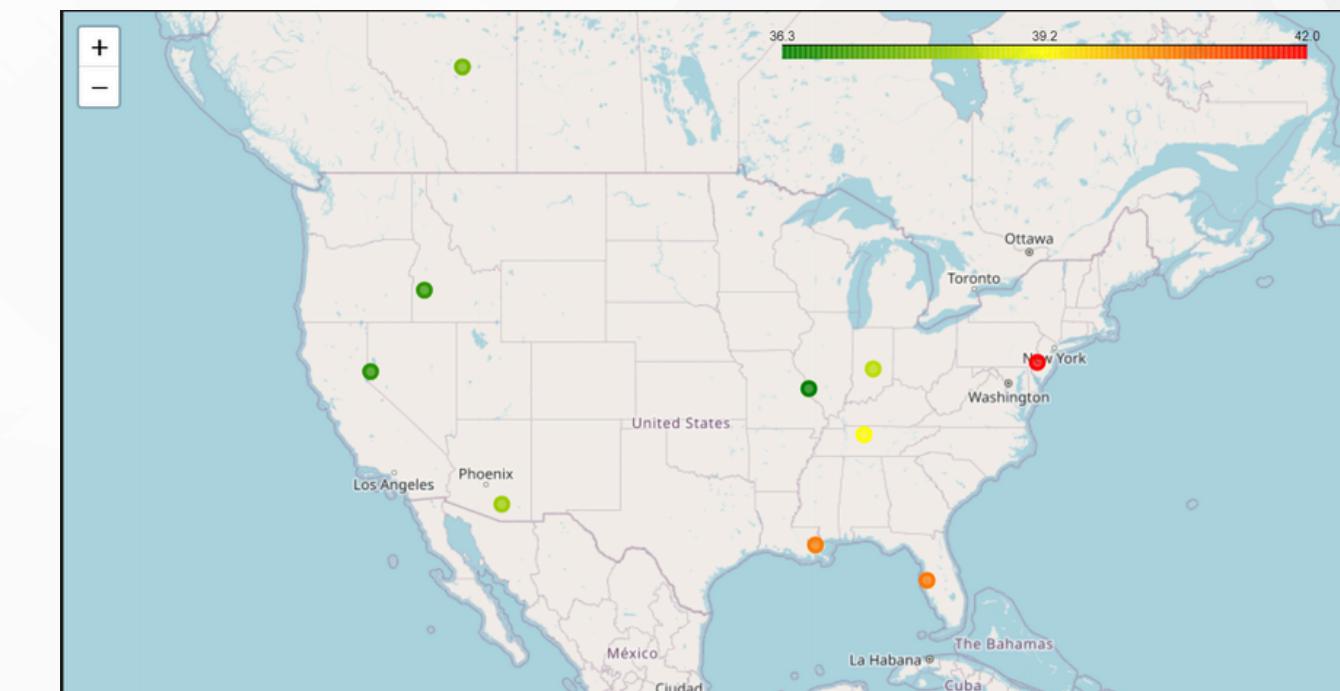
Category	AvgReviewCount	AvgTipCount	AvgCheckinCount
HighRated	59.930173	9.227997	99.444655
LowRated	36.252239	6.285836	76.194429



HOW DO THE SUCCESS METRICS OF RESTAURANTS VARY ACROSS DIFFERENT STATES AND CITIES?

- Philadelphia leads with the highest success score, driven by high ratings and active user engagement.
- Following Philadelphia, Tampa, Indianapolis, and Tucson also rank among the top cities, showcasing vibrant restaurant scenes and notable success scores.

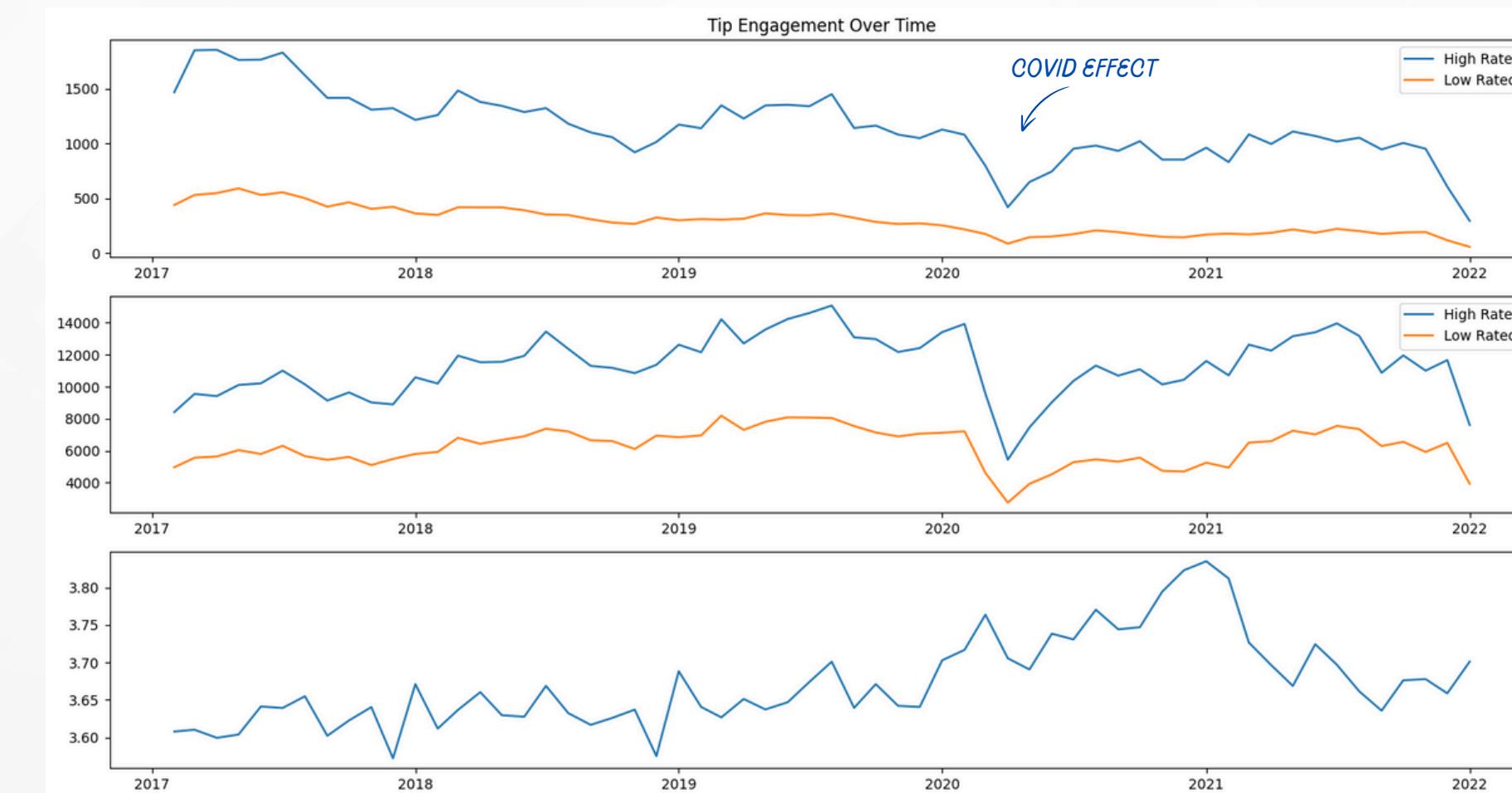
city	state	latitude	longitude	avg_rating	review_count	restaurant_count
Philadelphia	PA	39.955505	-75.155564	3.520028	151288	2896
Tampa	FL	27.890814	-82.502346	3.556962	91434	1659
Indianapolis	IN	39.637133	-86.127217	3.395293	82543	1657
Tucson	AZ	32.338572	-111.010760	3.372356	80511	1371
Nashville	TN	36.208102	-86.768170	3.483432	76468	1358
New Orleans	LA	29.963974	-90.042604	3.687372	60485	974
Edmonton	AB	53.436403	-113.604288	3.509073	45216	1543
Saint Louis	MO	38.583223	-90.407187	3.395513	44446	780
Reno	NV	39.476518	-119.784037	3.460644	41418	559
Boise	ID	43.611192	-116.206275	3.545788	32684	546





ARE THERE ANY PATTERNS IN USER ENGAGEMENT OVER TIME FOR SUCCESSFUL BUSINESSES COMPARED TO LESS SUCCESSFUL ONES?

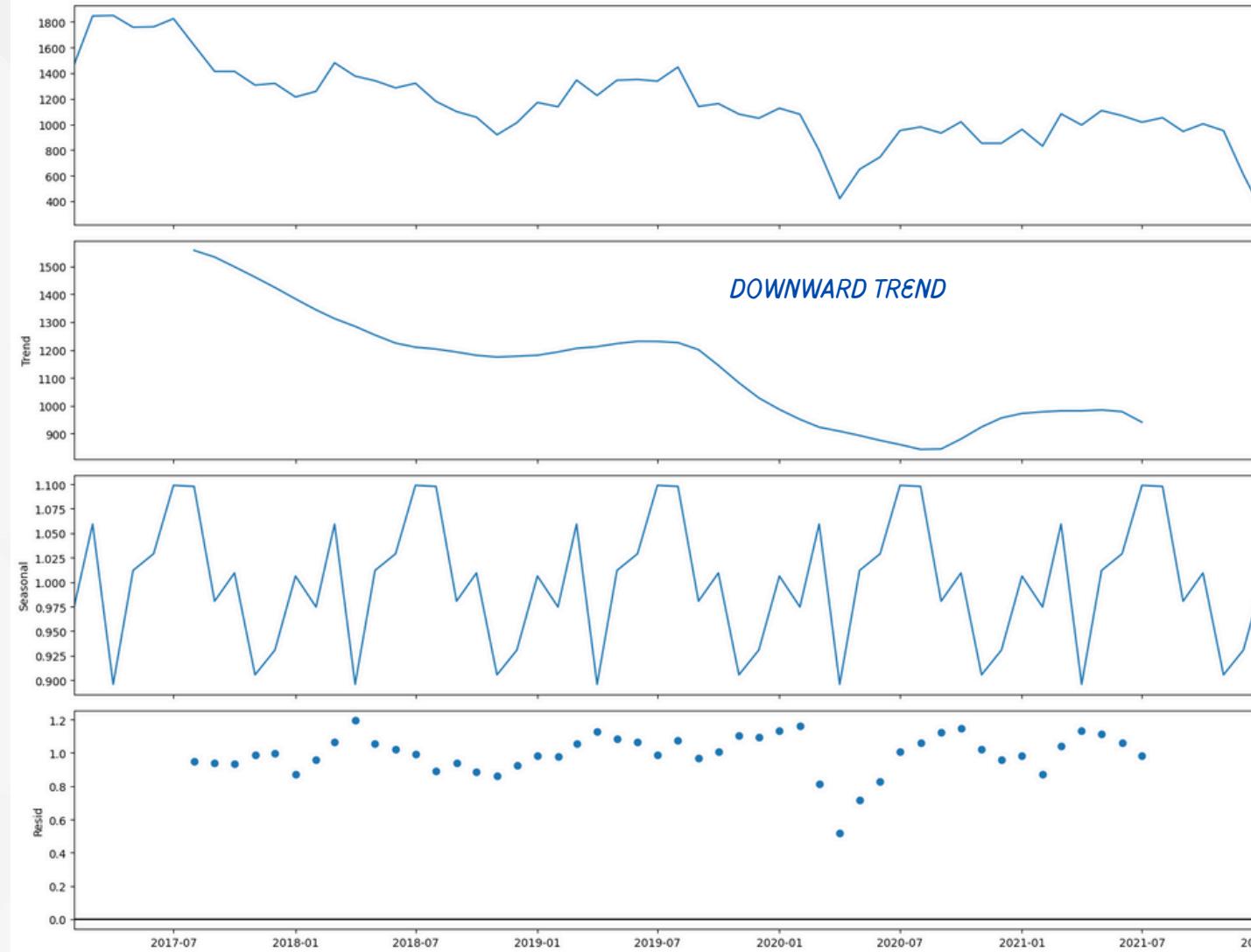
- Successful businesses, especially those rated above 3.5 stars, demonstrate consistent and potentially increasing user engagement over time.
- Highly rated restaurants maintain a steady or growing level of user engagement over time, indicating sustained customer satisfaction.



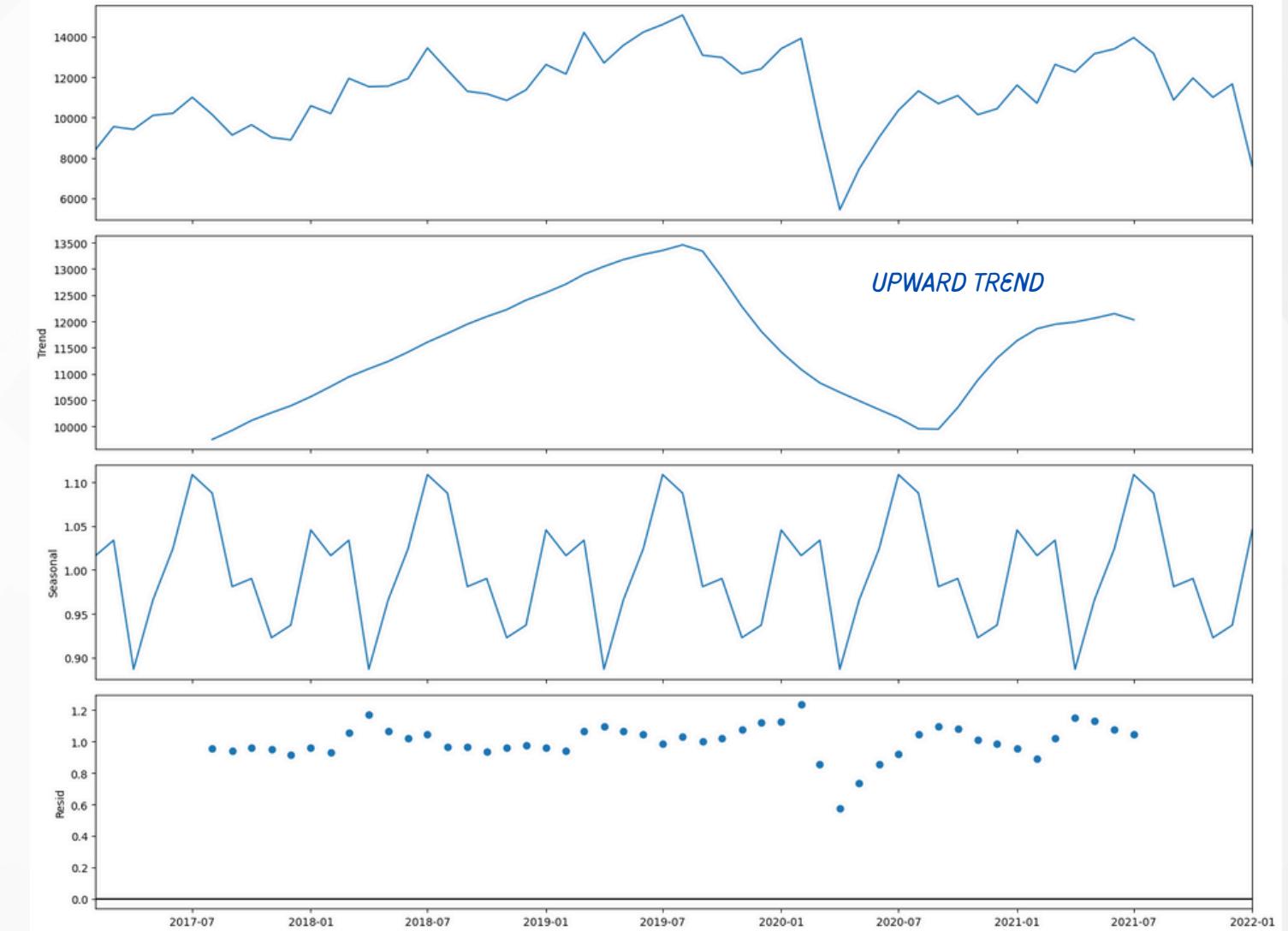


TREND & SEASONALITY ANALYSIS

TIP COUNT



REVIEW COUNT

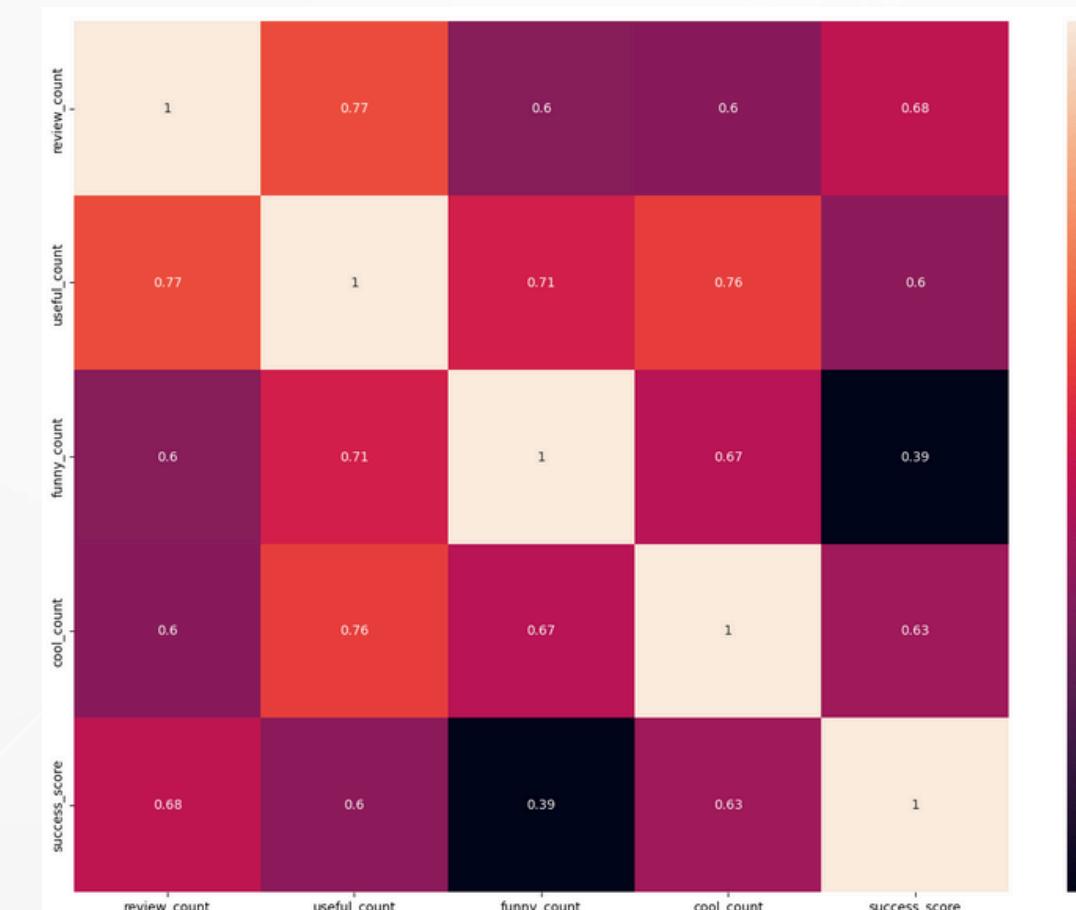


Timespan from the month November to March is highly engaging



HOW DOES THE SENTIMENT OF REVIEWS AND TIPS (USEFUL,FUNNY,COOL) CORRELATE WITH THE SUCCESS METRICS OF RESTAURANTS?

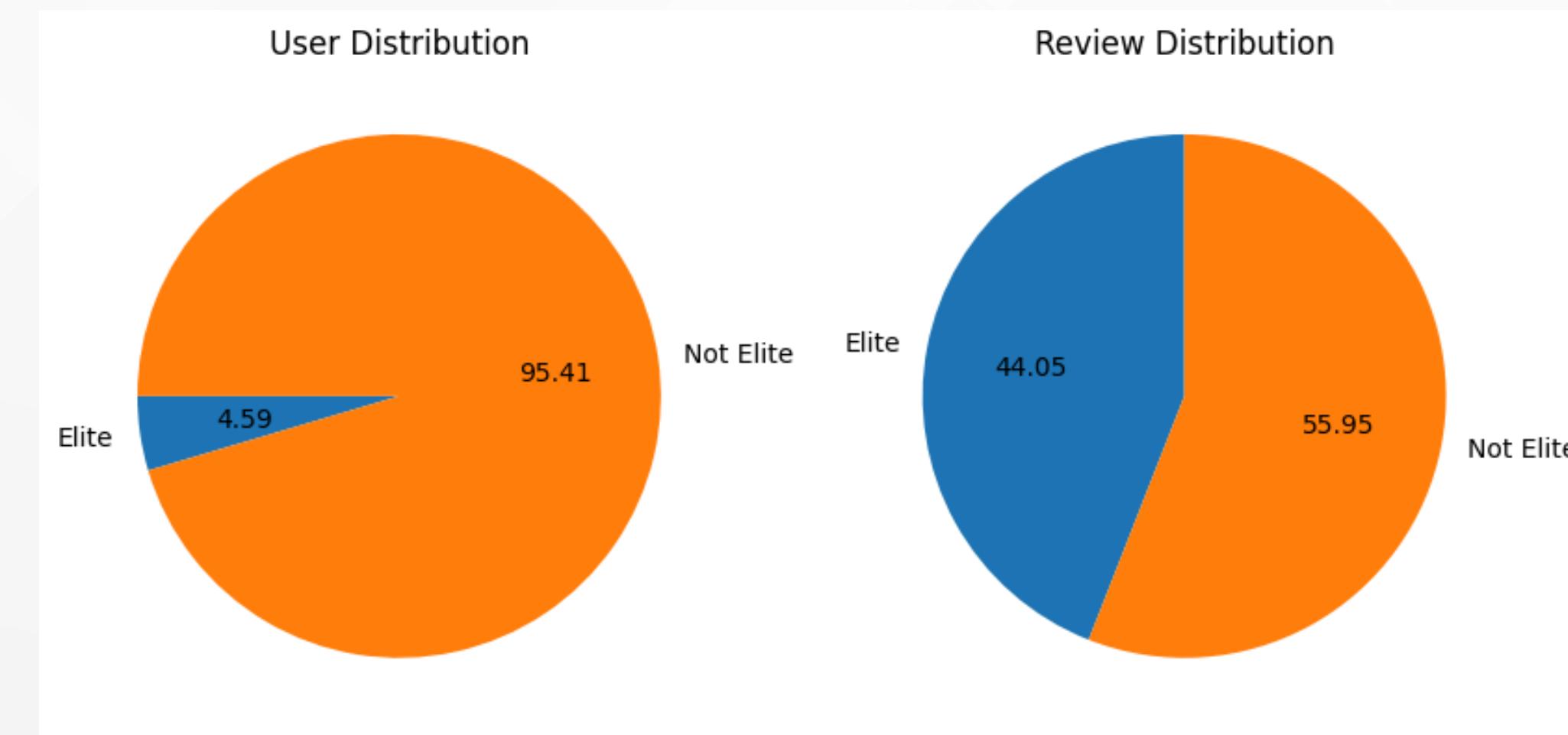
- Attributes like "useful," "funny," and "cool" are categories commonly used in user reviews. They reflect how users perceive the helpfulness, humor, or appeal of specific reviews.
- Higher counts of these attributes indicate increased user engagement and satisfaction. This feedback is pivotal in shaping a restaurant's success.





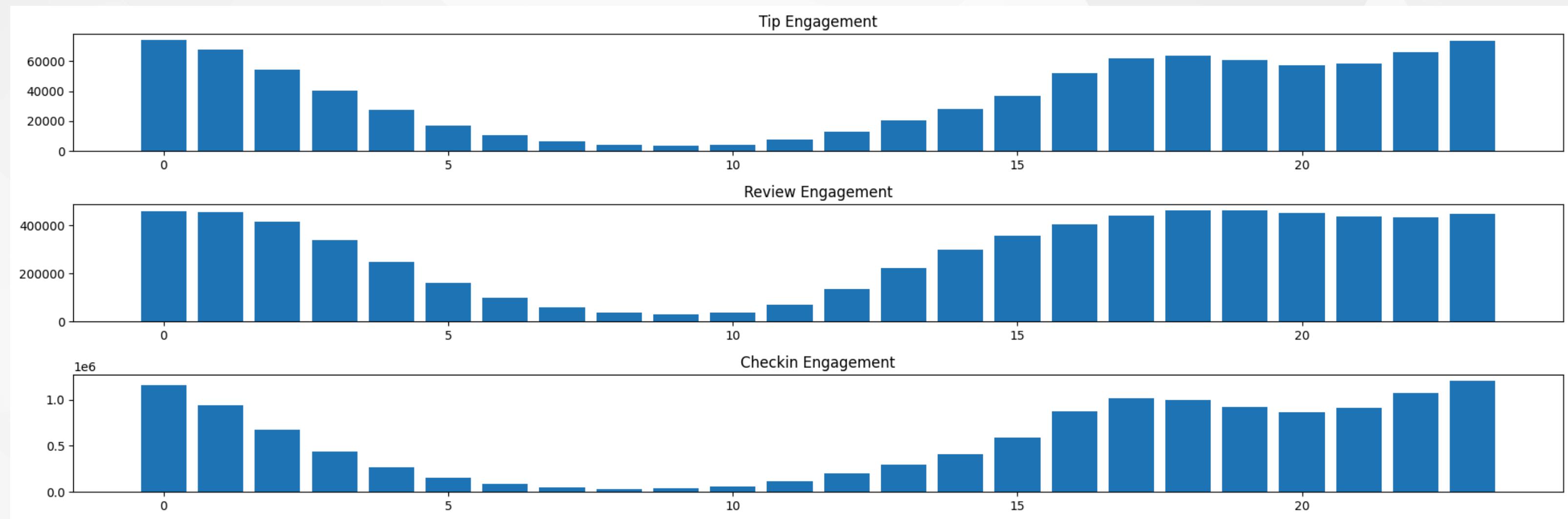
IS THERE ANY DIFFERENCE IN ENGAGEMENT OF ELITE USERS AND NON-ELITE USERS?

- "Elite users are individuals distinguished and awarded the 'Elite' status by Yelp for their frequent and high-quality contributions.
- Despite their smaller numbers, elite users contribute a significant proportion of total reviews compared to non-elite users.
- Building a positive relationship with elite users can foster repeat visits and loyalty, as they are inclined to continue patronizing businesses where they've had positive experiences."





BUSIEST HOURS



- "The peak hours for restaurants, based on user engagement, typically range from 4pm to 1am.
- Understanding these peak times enables businesses to optimize staffing and allocate resources effectively to ensure efficient operations and quality service delivery.
- The concentration of user engagement during evening and nighttime hours indicates heightened demand for dining out, likely influenced by factors such as work schedules, social gatherings, and leisure activities."



RECOMMENDATIONS

- BY ANALYZING METRICS SUCH AS USER ENGAGEMENT, SENTIMENT ANALYSIS OF REVIEWS, PEAK HOURS, AND THE INFLUENCE OF ELITE USERS, BUSINESSES CAN MAKE DATA-DRIVEN DECISIONS TO ENHANCE SUCCESS.
- COLLABORATING WITH ELITE USERS AND LEVERAGING THEIR INFLUENCE CAN AMPLIFY PROMOTIONAL EFFORTS, INCREASE BRAND AWARENESS, AND ATTRACT NEW CUSTOMERS.
- BUSINESSES CAN OPTIMIZE OPERATIONS BY ADJUSTING HOURS OR LAUNCHING SPECIAL PROMOTIONS DURING PEAK PERIODS OF DEMAND.
- LESS SUCCESSFUL BUSINESSES SHOULD FOCUS ON STRATEGIES TO BOOST LONG-TERM USER ENGAGEMENT, SUCH AS IMPROVING SERVICE QUALITY AND RESPONDING EFFECTIVELY TO CUSTOMER FEEDBACK.
- CITIES WITH HIGH SUCCESS SCORES PRESENT OPPORTUNITIES FOR RESTAURANT CHAINS TO EXPAND OPERATIONS OR INCREASE INVESTMENT.

**THANK
YOU**