INSY 442 – Data Analysis and Visualization

Yelp Inc. – Driving the Future of Reviewing

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I. Executive Summary

In our analysis, we focused on the company Yelp. Yelp’s traditional review business model has faced increasing industry pressures from new competitors and the rise of influencer marketing across new platforms. In this report, we advise Yelp on a new strategy to allow the company to regain its competitive positioning in the market and create shareholder value.

Our analysis revealed that both Yelp’s users and businesses are highly segmented into 3 main buckets: “power users/businesses”, “average users/businesses” and “least active users/lower-rated businesses”. We identified an opportunity for Yelp to generate more traffic to its platform by leveraging and turning our average user and business cluster into power users. Most of the revenue creation potential lies in this, as these businesses perceive the most value from the platform and are willing to advertise more aggressively. Our strategy relies on influencer marketing and partnerships to generate more traffic to the platform, incentivizing businesses to increase their ad spend and creating revenue growth opportunities for Yelp. Our flywheel strategy, discussed in more detail in the report, is expected to make a 10.6% upside for Yelp’s stock in our most conservative scenario, net of management’s improvement trajectory.

II. Yelp Overview

A. Company Overview

Yelp is a review application headquartered in San Francisco that started its mission to “connect people with great local businesses” in 2004. Yelp has two primary customers, its user base who use the platform to find local businesses depending on their needs – Yelp covers a variety of business types – and its businesses that generate revenue for the company. The platform is free to access for users, while businesses pay for advertisements to receive better search rankings and hence get matched more frequently to user queries. Yelp is present in over 30 countries; however, its revenue is very geography-centric, with more than 99% of its revenue being generated in the United States (Appendix 1).

B. Financial Performance

While Yelp’s business model aligns with that of the industry, we underline its poor performance over the last 10 years (Appendix 2). When compared to the S&P500 and the S&P500 Customer Discretionary Index – under which Yelps falls – we notice that the company has not been able to keep up with the industry and that the gap has been widening, especially since the COVID-19 recovery. We contrast this to Yelp’s revenue increase over the last 5 years (Appendix 3), which suggests that while the company can increase its topline growth, it is not able to convert that into shareholder value, a considerable problem for any public company. Before discussing the reasons for this trend, we first establish Yelp’s revenue model.

C. Revenue Streams

Yelp's revenue consists of two segments: “Advertising” (97% of total revenue) and “Other” (3%) (Appendix 4). The “Advertising” segment, the core of Yelp's revenue model, operates on an auction-based system where businesses bid for visibility in search results, with the highest bidder securing top placement. “Services” businesses, such as electricians and plumbers, account for 63% of this revenue, while the “Restaurants, Retail, and Others” (RR&O) segment has shown a more conservative approach (Appendix 5). According to Yelp's CFO, the RR&O segment is increasingly shifting to alternative advertising platforms, placing pressure on this key revenue stream and contributing to a declining share price (Appendix 6). In 2023, Yelp reported $1.32 billion in revenue, with our financial dashboard providing insights into the company’s performance over the past five years (Appendices 7 and 8).

III. Industry Analysis

A. Competitors

Yelp faces significant competitive pressures from both traditional rivals and emerging industry trends. Established players like Google, TripAdvisor, and OpenTable offer integrated and efficient global services, such as Google Maps, which had over 1 billion monthly users and generated $11.1 billion in revenue in 2023 (Center AI; Appendix 9). Meanwhile, newer competitors leverage social media and influencer-driven marketing to attract users. As Toast’s CMO notes, “42% of people prefer social media over traditional search engines to find restaurants” (Toast POS), with platforms like TikTok, Instagram, and Facebook drawing advertising budgets away from Yelp. These pressures are compressing Yelp’s margins, reducing profitability, and diminishing shareholder value.

B. New Industry Pressures

Yelp faces three significant industry pressures: competition from established, integrated players like Google that capture larger advertising budgets; a shift toward influencer marketing and emerging technologies; and the declining value of text-heavy reviews alongside a pricing model that drives businesses to competitors offering more cost-effective solutions (MGH). To address these challenges, our analysis focuses on strategies to enhance Yelp’s competitiveness and adaptability within the evolving review industry.

IV. Dataset Description

The dataset for this analysis was a scaled-down sample of Yelp’s database, containing 81,000 users and 6,000 businesses, randomly selected from over 1,000,000 rows. It integrated reviews, tips, business attributes, and user information, linked via primary keys like `business_id` and `user_id`, enabling segmentation and behavior analysis.

We performed Natural Language Processing (NLP) on review and tip text, transforming them into sentiment and subjectivity scores. These derived metrics were critical in evaluating customer perceptions, business performance, and user influence. The subset was cleaned and structured to ensure consistency, retaining sufficient variability for meaningful trend analysis while acknowledging its limitations as a sample. We believe that our sample is a representative subset of Yelp’s ecosystem by the rule of thumb of sufficient sample size drawn from the true distribution. Especially, the data reflects Yelp's operations up to the most recent reporting period, making it highly relevant for identifying current trends and opportunities.

V. Analysis

A. Business Statistics

We wanted to gain a deeper understanding of the types of businesses that were on Yelp, such as their performance and characteristics (Appendix 10). The average star rating of all the businesses is 3.63, with locations distributed around the world, but the majority being in North America, as explained earlier. While Yelp is mainly known for restaurant reviews, it has expanded to include all types of businesses, but despite this, nearly half of the businesses in our dataset (41%) still belong to food and dining. Check-ins represent a way for users to keep track of the businesses they visited, with most check-ins (54.15%) occurring on Saturdays. Possible explanations for this behavior can include users being more likely to go to a restaurant Saturday night, or more likely to visit a professional service on a Saturday if they work full-time during the week. Lastly, when the sentiment of the reviews is more positive, or if the number of reviews is higher, their average star rating will increase, and vice versa. Thus, both the quality and quantity of the reviews impact the business' rating.

B. User Statistics

We then analyzed the types of users on Yelp and how they interact with the businesses and each other (Appendix 11). The total number of fans (433,000) and friend connections (6 million) is high, which shows that users treat Yelp as a social platform to engage with other users and not solely a place to leave reviews. In terms of number of reviews, nearly 75% of users have written between 0 and 50, around 25% have between 51 and 1000, and less than 1% have written over 1000. Perhaps most users are not necessarily using Yelp to write reviews, but wish to see what other people are saying about the businesses they are interested in. Once again, this reinforces the idea of Yelp being used as a social platform and being a place for certain users to have more influence. The distribution of star ratings shows that most users tend to give ratings between 3 and 4 stars, with higher amounts of higher ratings. Finally, we can see that the user registration on Yelp peaked in 2014 with 11,258 users and has been steadily declining since then (registration dwindled to a mere 2,719 in 2019). As mentioned previously, there are now a lot more competitors in the review industry, and Yelp currently does not offer any incentives for users to sign up, so they are choosing to use other platforms instead. We see an opportunity to grow Yelp on this front and leverage its social component.

C. Business Segmentation: Promising Grower on Yelp

We conducted a segmentation analysis on Yelp businesses using hierarchical clustering, identifying three distinct clusters (Appendix 12). Of these, Cluster 1, comprising 2,391 medium-range businesses, represents a key growth opportunity. These businesses stand out due to their unique mix of attributes and behaviors, highlighting the significant potential for Yelp to strengthen its value proposition and drive engagement.

Cluster 1 businesses maintain a moderate star rating of approximately 3.9 (improvable reputation). This positions them as promising candidates for targeted interventions. While their ratings are not as high as top-tier businesses in Cluster 0, they consistently outperform bottom-tier businesses in Cluster 2 (3.4 ratings), demonstrating clear potential to transition into the top-tier category with the right support. A sentimental analysis of reviews for Cluster 1 businesses also revealed positive but mixed feedback (0.23, scale between -1 and 1). These businesses engage customers but often fail to exceed expectations consistently. Yelp can leverage tailored advertising strategies to help these businesses enhance customer experiences and ratings.

A critical insight is the invariance in subjectivity levels across all clusters (>=0.46, neutral perceptions). This shows that moderate ratings in Cluster 1 reflect genuine service experiences rather than unusually critical or lenient customers, reinforcing the need for actionable service quality improvements to drive upward mobility.

In addition, Cluster 1 businesses exhibit the highest information completion rates on Yelp (167) (proactive engagement). This reflects their efforts to provide detailed profiles and updated content. Top-tier businesses in Cluster 0 rely more on established reputations (37), while bottom-tier businesses in Cluster 2 often neglect these features (147). The proactive nature of Cluster 1 businesses makes them ideal candidates for targeted support and promotional strategies.

Targeting Cluster 1 businesses provides a unique opportunity for Yelp to act as a growth partner for mid-level businesses.

D. User Segmentation: Power Users and Growing Influencers

Using K-Means clustering, we segmented Yelp's user base into two key groups: Power Users and Growing Influencers, each playing unique yet complementary roles within the platform's ecosystem (Appendix 13). This analysis revealed 33 Power Users and 326 Growing Influencers, together forming the foundation of Yelp's engagement strategy.

Power Users, representing just 0.033% of the user base, are the platform's most influential contributors. These users demonstrate exceptional engagement, loyalty, and influence, making them pivotal to Yelp's marketing and community-building efforts. They attract the highest number of fans and compliments, establishing credibility within the platform. On average, Power Users maintain elite memberships for 7.76 years, highlighting their sustained commitment to Yelp. Their extensive review activity further cements their role as trusted authorities on local businesses. This group is central to Yelp's flywheel strategy, as their endorsements significantly enhance the visibility and reputation of medium-sized businesses. By leveraging Power Users' influence, Yelp can amplify platform engagement and deliver measurable value to both users and businesses.

Growing Influencers, accounting for 0.326% of the user base, represent a segment with strong potential to evolve into Power Users. These users maintain consistent engagement, with an average of 917.77 reviews and 5,607 yelping days, figures close to those of Power Users (5,821 days). Their average elite membership length of 6.4 years is only slightly shorter than that of Power Users, underscoring their steady contribution to the platform. Strategically, fostering Growing Influencers through gamification, recognition programs, and personalized incentives can nurture their transition into Power Users. This approach not only enhances user retention but also reduces Yelp's reliance on its most influential users by building a scalable pipeline of active contributors.

Together, the 33 Power Users and 326 Growing Influencers form a symbiotic relationship that drives platform growth. Power Users bring credibility and influence while Growing Influencers provide scalability and diversification. By aligning its strategy to support and leverage these key segments, Yelp can strengthen its ecosystem, enhancing engagement and delivering value to users and businesses alike.

VI. Recommendation

We developed a comprehensive “360-degree Strategy” to address Yelp’s revenue challenges, competitive pressures, and shifting customer dynamics, leveraging insights from our customer and business analyses. This strategy builds on Yelp’s core strength of connecting users with businesses based on tailored search criteria. By activating power users and influencers to drive traffic toward businesses that effectively utilize Yelp, the strategy aims to enhance user engagement and boost advertising spending. The approach establishes a reinforcing flywheel effect. Power users (Cluster 1) collaborate with Yelp to direct traffic toward high-potential businesses, identified as Cluster 1 businesses (Appendix 14). These businesses, experiencing increased visibility and value from Yelp’s network, are more likely to expand their advertising investments. The resulting revenue growth will enable Yelp to strengthen partnerships with influencers, attract more users, and further sustain the cycle. This self-reinforcing dynamic bolsters Yelp’s advertising segment, addressing competitive pressures that could otherwise drive businesses to alternative platforms. By fostering higher user engagement and supporting businesses, this strategy enhances Yelp’s value proposition. It simultaneously mitigates the risks posed by digitalization trends and competitors like Instagram and TikTok, ensuring Yelp’s resilience in a rapidly evolving market.

VII. Impact

To quantify the impact of our recommendation and demonstrate its potential to create shareholder value, we developed a financial model. This model incorporates management’s projections (Appendix 15) and evaluates how implementing our strategy could influence Yelp’s financial performance.

We analyzed three scenarios—bear, base, and bull—representing varying levels of confidence in management’s ability to execute the strategy. In the base case, we conservatively estimated Yelp could double its power businesses within five years, resulting in proportional growth in EBIT (earnings before interest and tax). The bear case assumed a 33% increase in power businesses, while the bull case projected a 2.5x growth. Our base case predicts a 10.6% upside net of management’s current trajectory, reversing its recent downturn. Under the bull case, the upside could reach 33% (Appendix 17).

Based on our sensitivity analysis, we anticipate Yelp’s stock price could rise between 12% and 34%, moving from $36.46 currently to a range of $40.82 to $48.83, depending on execution success. Given Yelp’s strong leadership we believe the company is more likely to outperform than underperform. Detailed projections and scenario toggles are available in Appendix 15 to 17 and the accompanying Excel file.

Citations

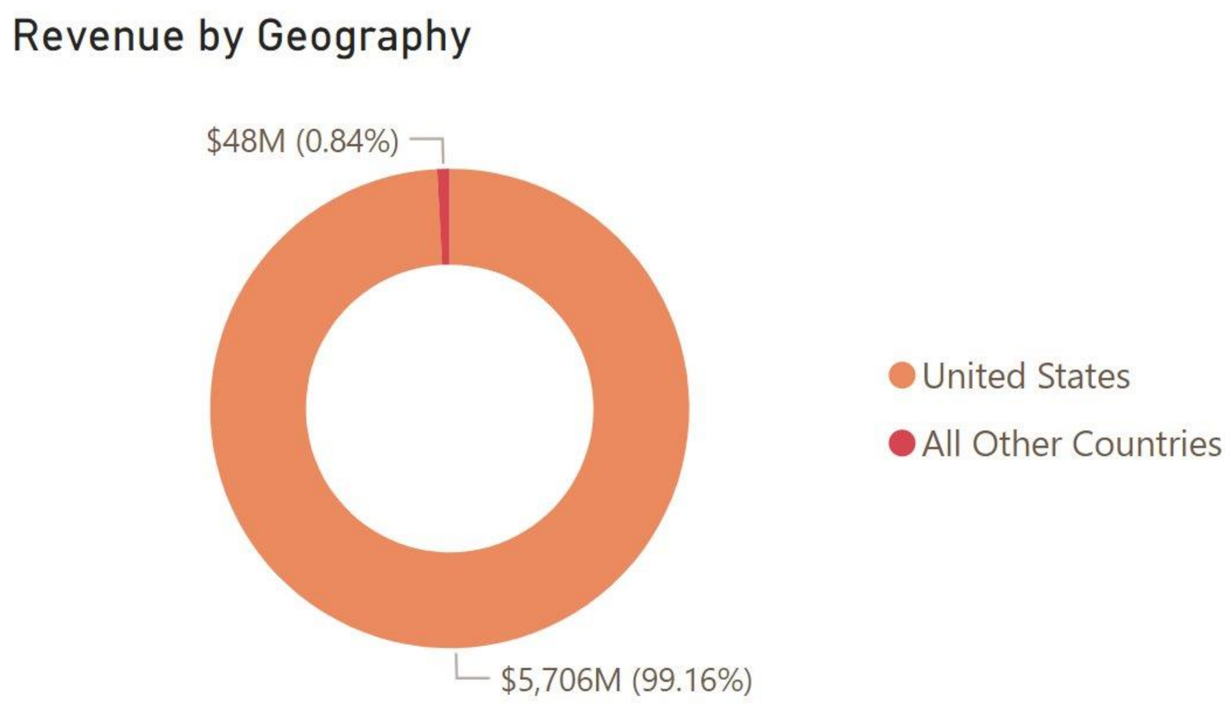
"(Survey) TikTok's Major Influence on Today's Dining Behavior." *MGH Marketing & Advertising*, www.mghus.com/blog/tiktoks-major-influence-on-todays-dining-behavior. Accessed 25 Nov. 2024.

How to Create a Social Media Strategy for Your Restaurant - on the Line | Toast Pos, pos.toasttab.com/blog/on-the-line/restaurant-social-media-strategy. Accessed 25 Nov. 2024.

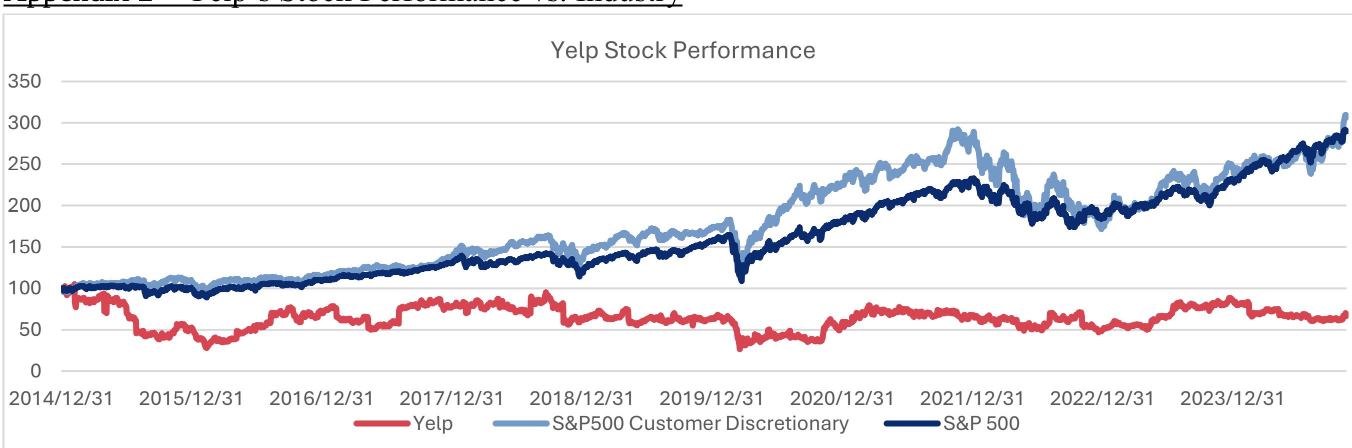
Weronika. "Google Maps Statistics and Interesting Facts." *Center AI*, 10 Oct. 2024, center.ai/blog/google-maps-statistics-and-interesting-facts/#:~:text=Estimated%20by%20Morgan%20Stanley%2C%20Google,accounting%20for%2016.5%25%20in%202022.

Appendix

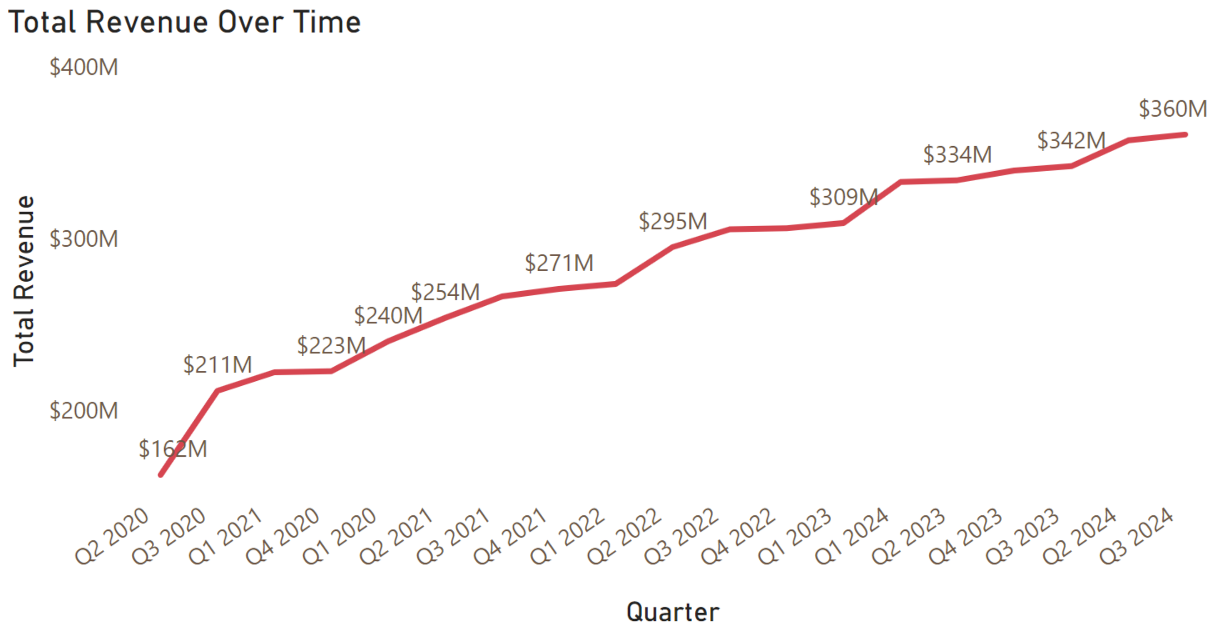
Appendix 1 – Yelp's Revenue Breakdown by Geography



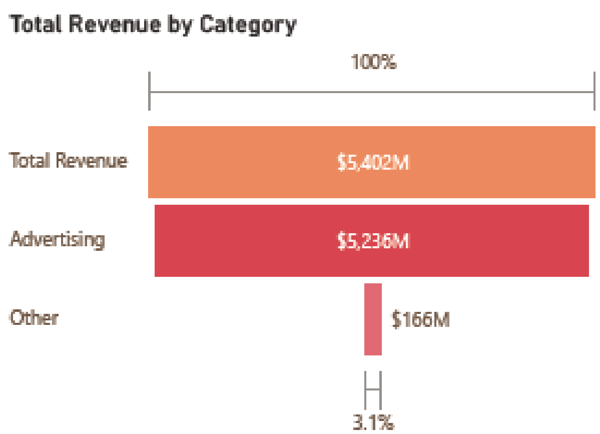
Appendix 2 – Yelp's Stock Performance vs. Industry



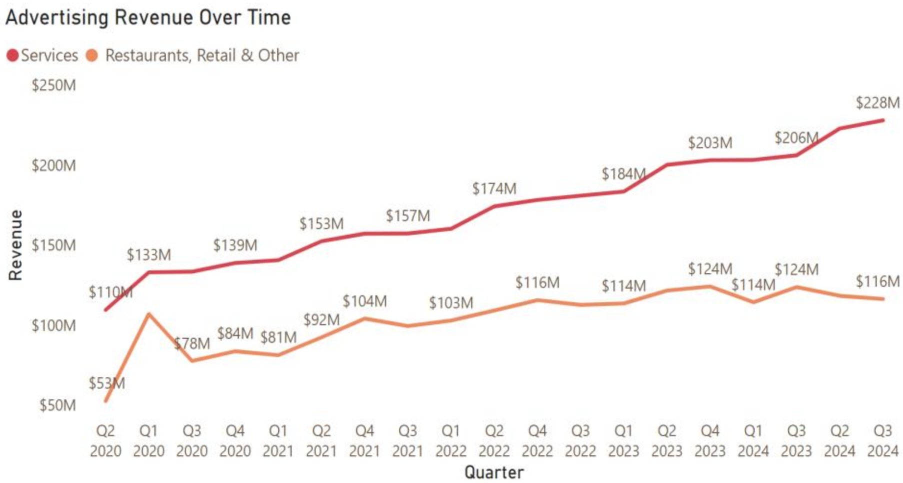
Appendix 3 – Yelp's Revenue over Time (Q1, 2020 – Q3, 2024)



Appendix 4 – Yelp Revenue by Category



Appendix 5 – Yelp's "Advertising" Segment Revenue over Time



Appendix 6 – Yelp's CFO David Schwarzbach Discussing RR&O Segment

"

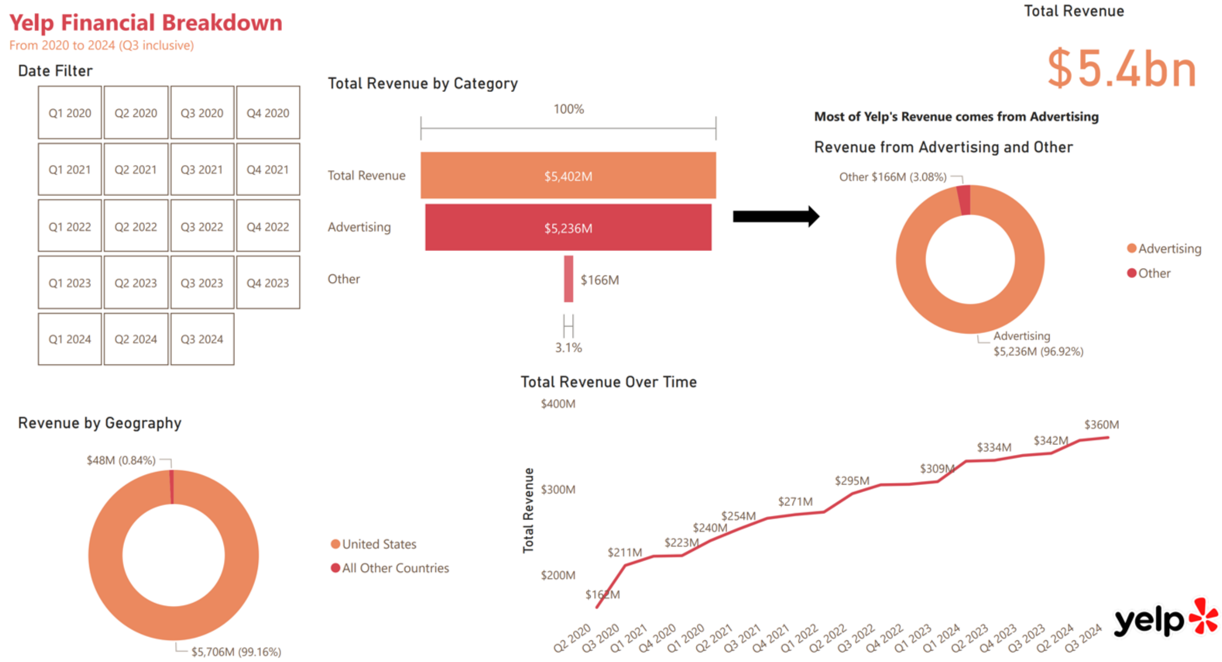
We believe the decrease in RR&O paying advertising locations reflects the challenging operating environment facing businesses in these categories.

"

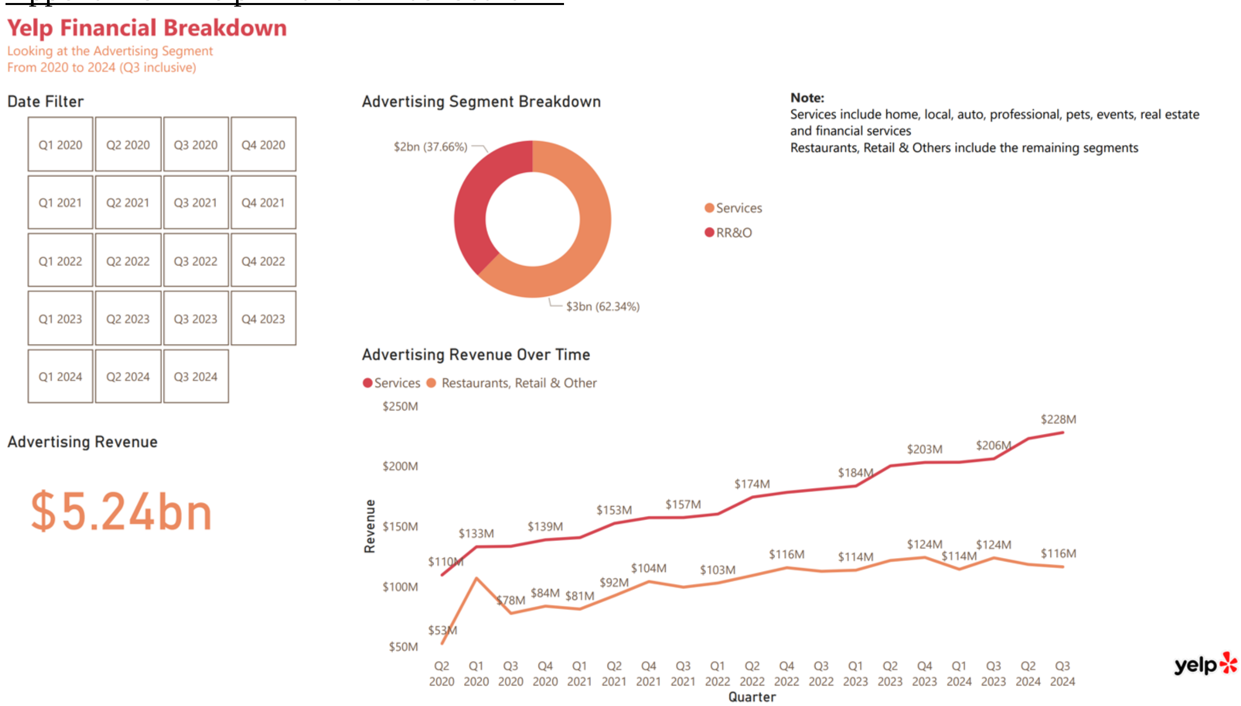
David Schwarzbach

Yelp CFO

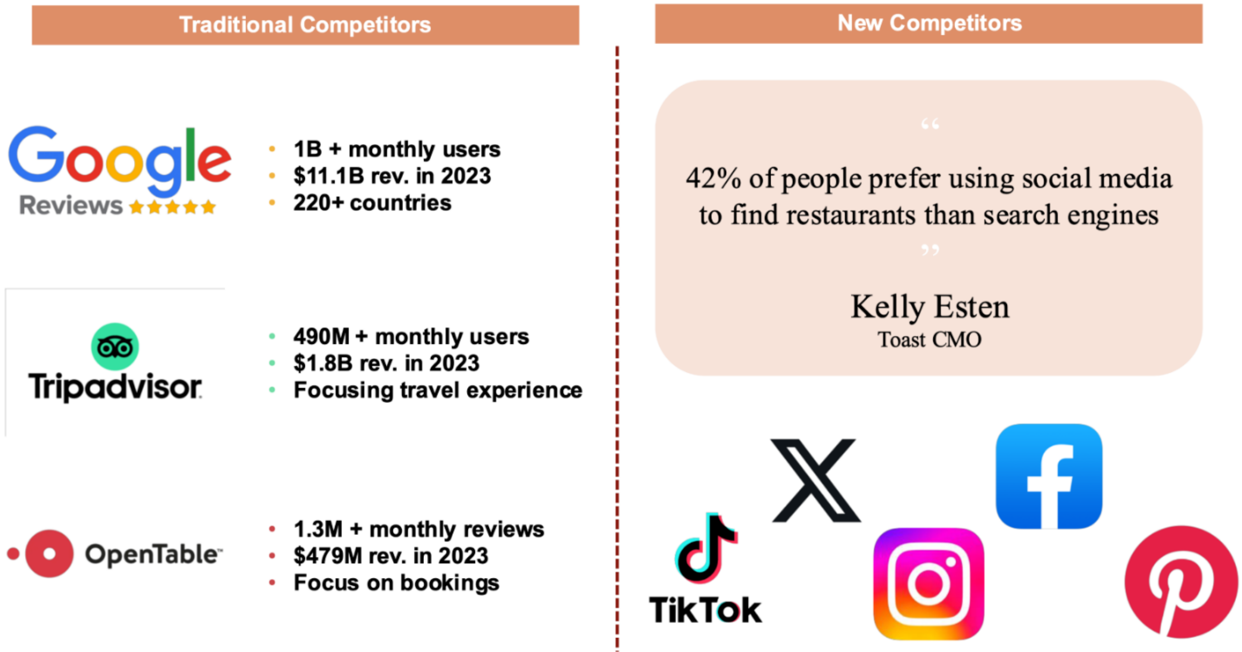
Appendix 7 – Yelp Financial Dashboard #1



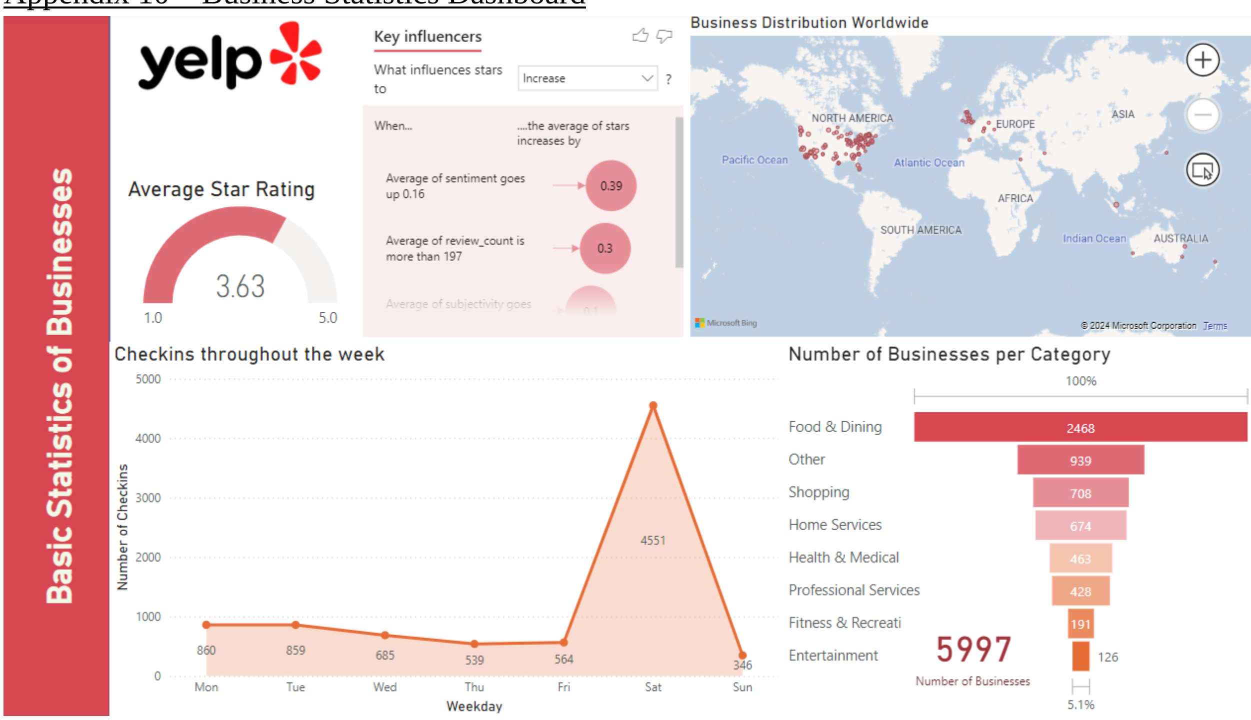
Appendix 8 – Yelp Financial Dashboard #2



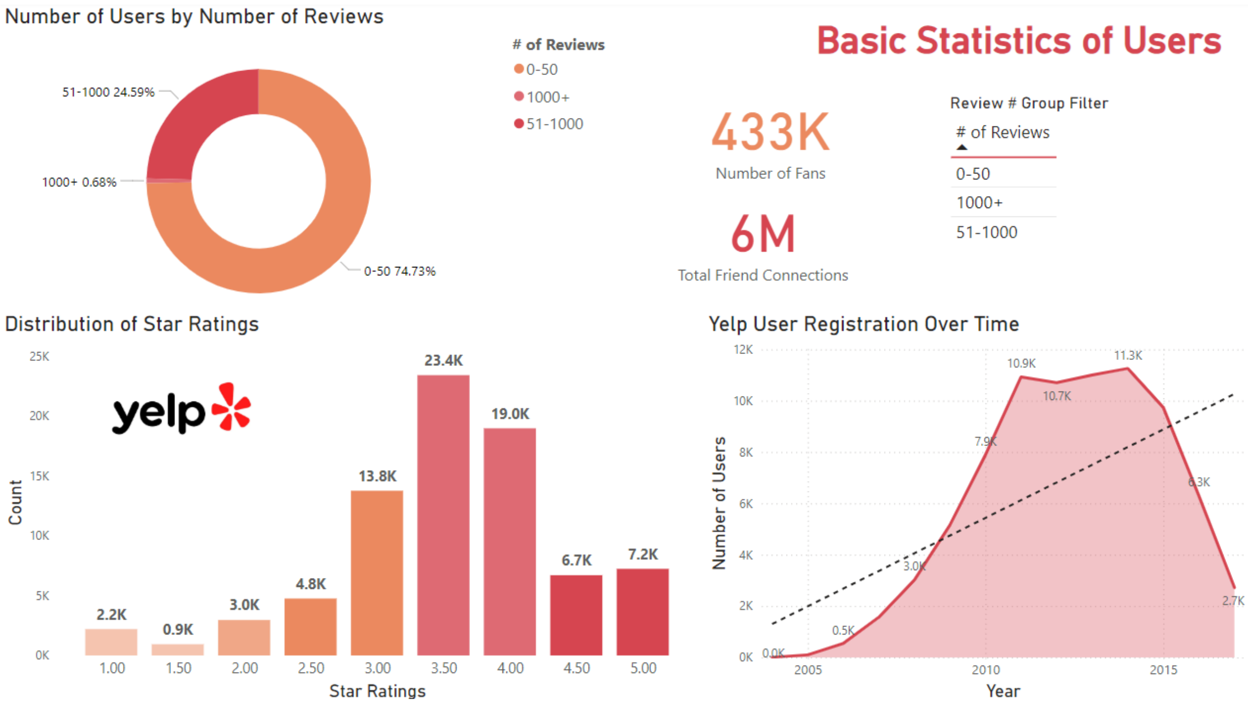
Appendix 9 – Industry Analysis



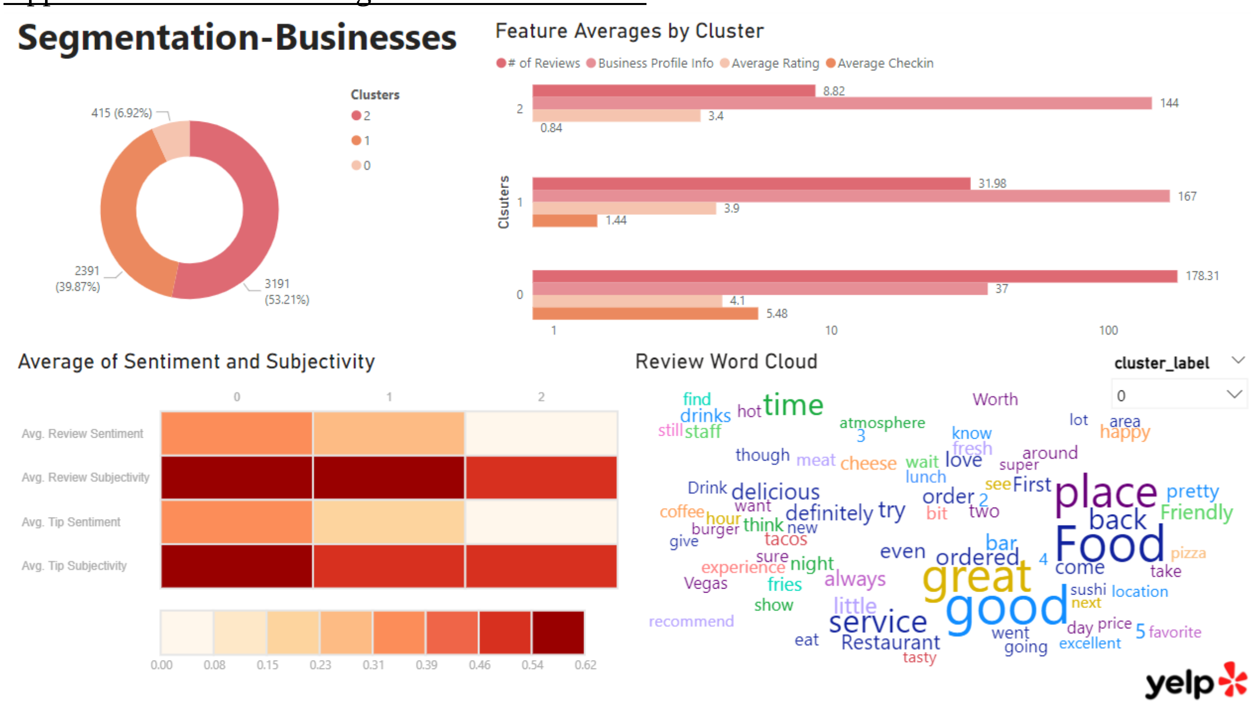
Appendix 10 – Business Statistics Dashboard



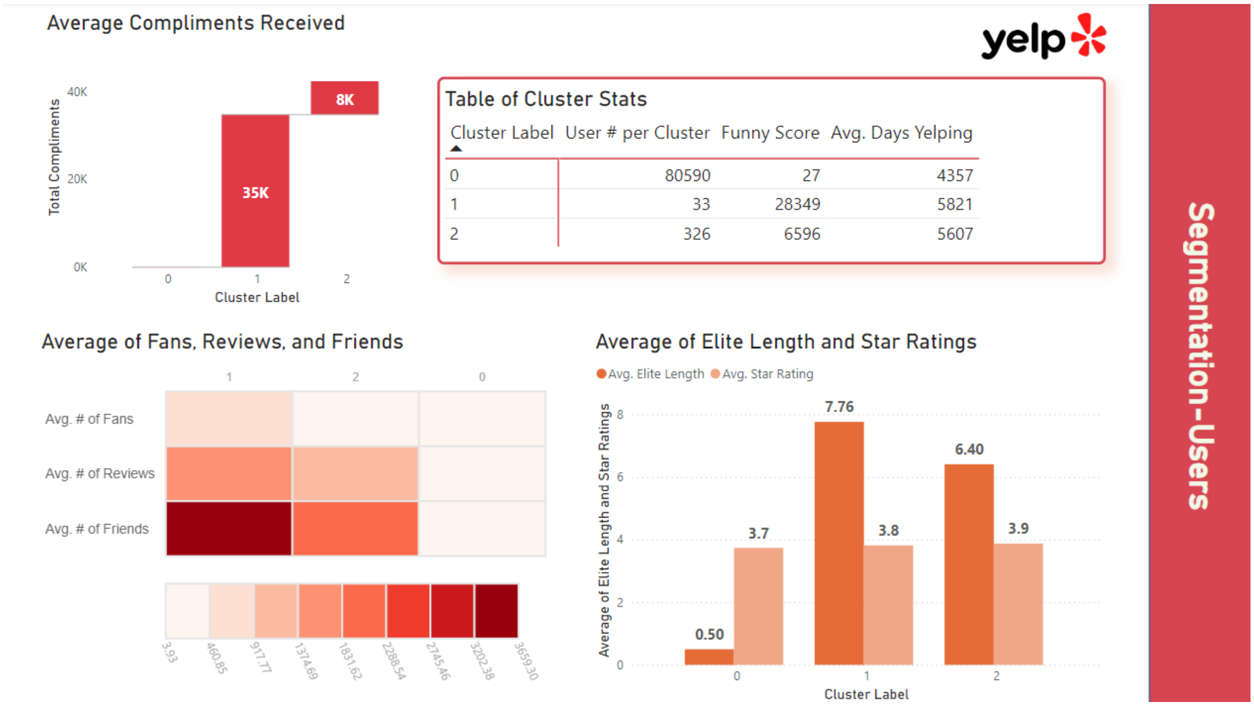
Appendix 11 – User Statistics Dashboard



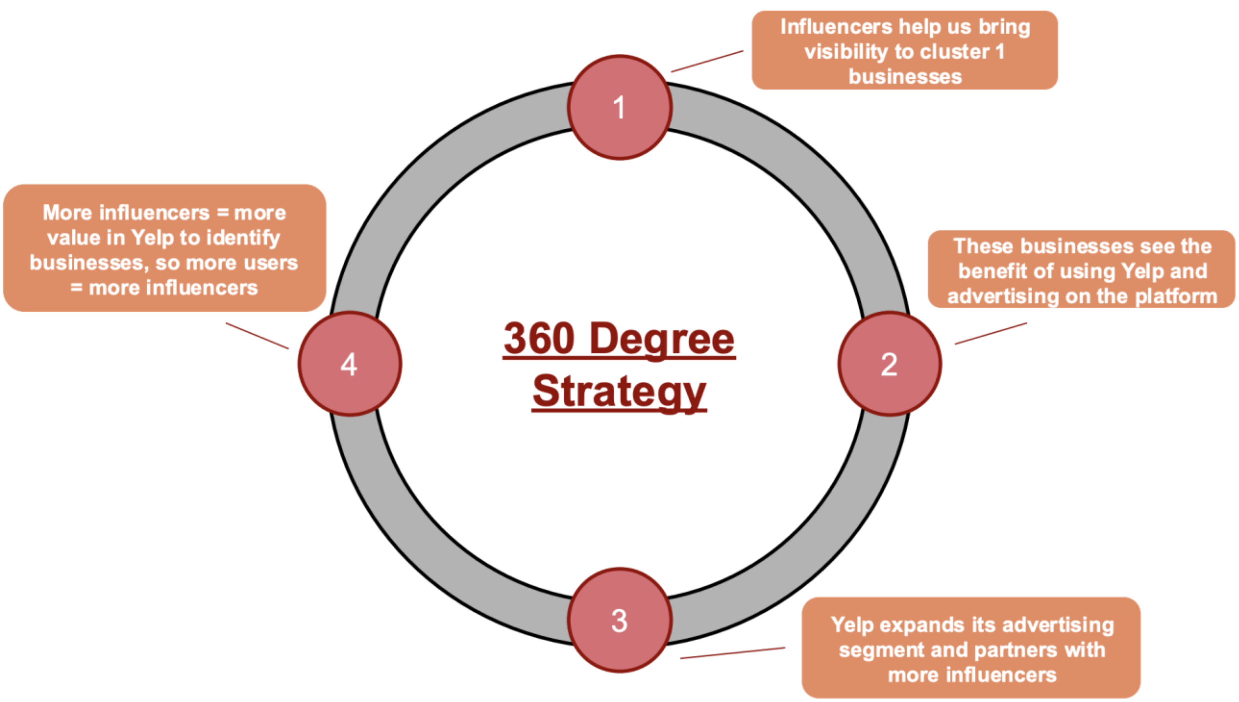
Appendix 12 – Business Segmentation Dashboard



<u>Appendix 13 – User Segmentation Dashboard</u>



<u>Appendix 14 – 360 Degree Strategy</u>



Appendix 15 – Yelp Financial Assumptions

Yelp - Assumptions

					Forecasted					
		2022A	2023A	2024A	2025E	2026E	2027E	2028E	2029E	2030E
1 Income Statement										
1 Revenues										
Operating Revenues	2	15.7%	12.0%	4.7%	8.6%	3.5%	7.6%	7.6%	7.2%	8.5%
Bear	1				6.6%	1.5%	5.6%	5.6%	5.2%	6.5%
Base	2				8.6%	3.5%	7.6%	7.6%	7.2%	8.5%
Bull	3				9.6%	4.5%	8.6%	8.6%	8.2%	9.5%
2 EBIT										
EBIT as % of revenue	2	4.9%	5.9%	9.8%	10.2%	10.5%	11.6%	7.8%	10.0%	9.8%
Bear	1				8.2%	8.5%	9.6%	5.8%	8.0%	7.8%
Base	2				10.2%	10.5%	11.6%	7.8%	10.0%	9.8%
Bull	3				11.2%	11.5%	12.6%	8.8%	11.0%	10.8%
2 Recommendation										
1 EBIT as % of Current EBIT										
EBIT Incremental Increase	2	-	-	-	3.0%	3.8%	4.6%	5.4%	6.1%	6.9%
Bear	1				1.0%	1.3%	1.5%	1.8%	2.0%	2.3%
Base	2				3.0%	3.8%	4.6%	5.4%	6.1%	6.9%
Bull	3				5.0%	5.8%	6.6%	7.4%	8.1%	8.9%

Note:

Base case assumes that Yelp can double the amount of "power businesses" from its baseline in 2024. We assume this happens in 5 years, with steady increments.

Bull case assumes that Yelp can 2.5x the amount of "power businesses" from its baseline in 2024. We assume this happens in 5 years, with steady increments.

Bear case assumes that Yelp can only convert a 1/3 of the amount of "power businesses" from its baseline in 2024. We assume this happens in 5 years, with steady increments.

Table for Reference

	#of Users	% of Total
Cluster Label 0 - Power Users	415	6.92%
Cluster Label 1 - Average Business	2391	39.87%
Cluster Label 2 - Lower Quality	3191	53.21%
Total	5997	1

--> from dashboard analysis

Appendix 16 – Yelp Financial Schedule

Yelp - Schedule

	Historical				Forecasted					
	2021A	2022A	2023A	2024A	2025E	2026E	2027E	2028E	2029E	2030E
1 Income Statement										
1 Revenues										
Operating Revenue	$1,032	$1,194	$1,337	$1,401	$1,522	$1,575	$1,694	$1,823	$1,954	$2,119
YoY Growth		15.7%	12.0%	4.7%	8.6%	3.5%	7.6%	7.6%	7.2%	8.5%
Total Revenues	**$1,032**	**$1,194**	**$1,337**	**$1,401**	**$1,522**	**$1,575**	**$1,694**	**$1,823**	**$1,954**	**$2,119**
2 EBIT										
Operating Income	**$32**	**$58**	**$79**	**$137**	**$155**	**$166**	**$197**	**$143**	**$195**	**$208**
% of Revenue	3.1%	4.9%	5.9%	9.8%	10.2%	10.5%	11.6%	7.8%	10.0%	9.8%
2 Recommendation Tab										
1 FCF										
Current EBIT	-	-	-	-	**$155**	**$166**	**$197**	**$143**	**$195**	**$208**
New EBIT	-	-	-	-	$5	$6	$9	$8	$12	$14
% of current FCF	-	-	-	-	3.0%	3.8%	4.6%	5.4%	6.1%	6.9%

Appendix 17 – Yelp Financial Impact (DCF)

Yelp Inc. - DCF

0 Outputs

Case Running

Case Switch	Base
Case Running	2

Recommendation Switch

Recommendation On?	On

Recommendation Switch

For Reference	Upside
Recommendation Off	1.3%
Recommendation On	12.0%
Recommendation Incremental Growth	**10.6%**

General Assumptions

Valuation Date	11/19/2024
Ticker	YELP
Share Price	$36.46
FD Shares Outstanding	69.16
Cash	$261.59
Debt	$70.30

Bridge to Equity

Exit Multiple Method	
Discount Rate	9.4%
Sum of PV of Cash Flow	$705.22
Terminal Multiple	10x
Terminal Value	$2,649.12
PV of Terminal Value:	$1,545.25
Implied Terminal Enterprise Value	**$2,250.47**
(+) Cash	$261.59
(-) Debt	$70.30
Implied Equity Value	**$2,582.36**
Shares Outstanding	69.16
Implied Share Price	$37.34
Implied Upside/Downside	**2.4%**

Bridge to Equity

Gordon Growth Method	
Discount Rate	9.4%
Sum of PV of Cash Flow	$705.22
Terminal Growth Rate	1.0%
Terminal Value	$3,061.79
PV of Terminal Value	$1,785.96
Implied Terminal Enterprise Value	**$2,491.18**
(+) Cash	$261.59
(-) Debt	$70.30
Implied Equity Value	**$2,823.07**
Shares Outstanding	69.16
Implied Share Price	$40.82
Implied Upside/Downside	**12.0%**

DCF Assumptions

Tax Rate	20.0%
WACC	9.4%
Exit Multiple	10x
Perpetuity Growth Rate	1.0%

Note:
WACC from Bloomberg

1 DCF

	2025E	2026E	2027E	2028E	2029E	2030E
1 Current Business Model						
Revenue	$1,522	$1,575	$1,694	$1,823	$1,954	$2,119
% Growth	*8.6%*	*3.5%*	*7.6%*	*7.6%*	*7.2%*	*8.5%*
EBIT	$155	$166	$197	$143	$195	$208
% of Revenue	*10.2%*	*10.5%*	*11.6%*	*7.8%*	*10.0%*	*9.8%*
(-) Taxes	($31)	($33)	($39)	($29)	($39)	($42)
NOPAT	**$186**	**$199**	**$237**	**$171**	**$234**	**$250**
2 Addition of Our Recommendation						
EBIT from recommendation	$5	$6	$9	$8	$12	$14
% of Current EBIT	*3.0%*	*3.8%*	*4.6%*	*5.4%*	*6.1%*	*6.9%*
(-) Taxes	($1)	($1)	($2)	($2)	($2)	($3)
NOPAT	**$6**	**$8**	**$11**	**$9**	**$14**	**$17**
3 FCF						
Total NOPAT	**$192**	**$206**	**$248**	**$180**	**$249**	**$267**
(+) Depreciation & Amortization	$39	$39	$40	$40	$46	$49
(-) Capital Expenditures	($40)	($40)	($40)	($40)	($40)	($40)
(-) Change in Net Working Capital	($196)	($12)	($27)	($36)	($36)	($36)
Unlevered Free Cash Flow	($5)	$193	$220	$145	$219	$240
Discount Factor	0.91	0.84	0.76	0.70	0.64	0.58
Discounted Free Cash Flow	**($5)**	**$161**	**$168**	**$101**	**$140**	**$140**
Sum of PV of UFCF	**$705**					

2 Senstivity Analysis

Recommendation Incremental Growth

Terminal Value Multiple

Case	9.3x	9.8x	10.3x	10.8x	11.3x
Bear	(27%)	(25%)	(22%)	(20%)	(18%)
Base	(4%)	(1%)	2%	5%	8%
Bull	10%	13%	17%	20%	23%

Recommendation Incremental Growth

Perpetuity Growth Rate

Case	0.00%	0.50%	1.00%	1.50%	2.00%
Bear	(32%)	(29%)	(27%)	(24%)	(20%)
Base	2%	6%	11%	15%	21%
Bull	23%	27%	33%	39%	45%