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BEHAVIORAL-BASED SEGMENTATION: AN EMPIRICAL ANALYSIS OF THE FOOD DELIVERY MARKET

PURPOSE

- ➢ Identify the most lucrative market segments that GrubHub should target in order to maximize their growth potential and increase their market share.
- ➢ With a concentration on the preferences of food delivery service users, the goal of this study is to segment users into distinct clusters and identify any variations in motivational factors between segments through factor-cluster analysis

INTRODUCTION

With 111 million users in 2021, the food delivery market revenue has increased by more than 200% within the last five years. As apps like UberEats, GrubHub, and Doordash battle for the top spot, the United States remains one of the most competitive food delivery markets. These steep rivalries have forced companies to endure paper-thin profit margins in order to undercut competitors in return for market share. The former industry leader, GrubHub, has steadily been losing market share since 2015. From its previous control of roughly 70% of the market, the company is now left with under 20%. Its primary competitors, UberEats and DoorDash, have captured a collective 70% of the industry as of 2021[1]. In order to escape from this unsustainable price war and regain its former market status, GrubHub must look to differentiate itself by unlocking a new competitive advantage. To optimally appeal to the ideal population, segmenting through both cluster and factor analyses should be used to extract the motivations behind consumer behavior.

For this analysis, "food delivery service" is defined as a courier service in which independent food-delivery companies deliver food, from a restaurant or fast-food chain to an end consumer. Our study analyzes the three leading delivery services within the US: GrubHub, UberEats, and Doordash. According to Statista, individuals between 18 and 35 years old make up 65% of the

[1] "GrubHub: The Business Shouldn't Have Sold ." *SeekingAlpha*, 19 Feb. 2021, seekingalpha.com/article/4407439-GrubHub-business-shouldnt-have-sold.

market and generate the greatest demand for the service[2]. Many companies seek to target Generation Z, as they tend to be more tech-savvy, impatient, and experienced in online purchasing. Therefore, our survey, which samples students within the 18-25 age range, should provide insights into the underlying needs of the Gen Z demographic.

NEED FOR THE STUDY

Due to the rising popularity and adoption of food delivery services, it is critical that food delivery companies comprehend the underlying motives driving consumer behavior.
By utilizing effective segmentation techniques, companies can position themselves to target customers with high lifetime values and thus maximize the companies' ROI.
With the industry expected to be worth over $200 billion by 2025[3], GrubHub must ensure they are allocating their resources efficiently to remain in the competition.

FACTOR-CLUSTER ANALYSIS: MARKET SEGMENTATION

In order to efficiently allocate their promotional budget, companies have used cluster analysis for segmentation, typically grouping customers based on age, gender, income, etc.
Although these descriptive methods can offer surface-level insights for segmentation guidance, segmenting by demographic factors yields an insufficient basis for predicting consumer behavior. A better alternative would be segmenting by benefits method, which relies on causal factors to predict behavior. Companies can utilize a combination of multivariate methods, specifically factor and cluster analyses, to better understand what their customers value, and in turn improve their segmentation strategy.

Factor analysis considers an assortment of variables and reduces them to include the most relevant factors. With the assumption that people are nuanced and multi-dimensional, it assigns people into collections (factors) of their most relevant attributes. Cluster analysis, on the other hand, is a generalization technique that places similar people into mutually-exclusive groups,

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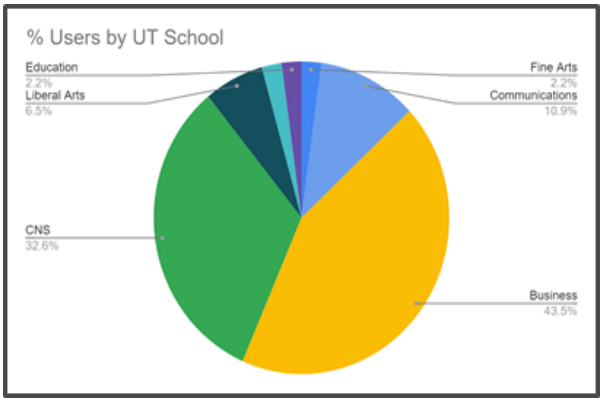
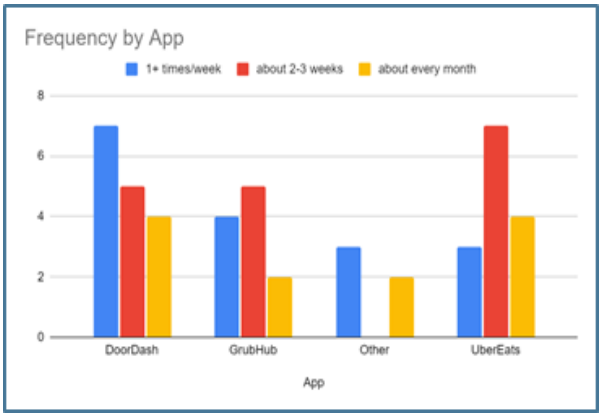
[2] "Online Food Delivery - Worldwide: Statista Market Forecast." *Statista*, www.statista.com/outlook/dmo/eservices/online-food-delivery/worldwide#key-market-indicators.

[3] "Food Delivery App Revenue and Usage Statistics (2021)." *Business of Apps*, 7 May 2021, www.businessofapps.com/data/food-delivery-app-market/.

creating distinct segments that companies can then target. Segmentation within the food delivery market has yet to be captured by a combination of both factor and cluster analyses, but these techniques provide insights that could enable brands to effectively align their offering to match the needs of their target market. In neglecting these research methods, companies are severely limiting their growth and earning potential. This study aims to fill the holes in the literature by illustrating the benefits of a factor and cluster segmentation technique, and providing key strategies to GrubHub for increasing its market share.

RESEARCH AND ANALYSIS





To understand consumer app usage and preferences, we first designed a Qualtrics survey and distributed it to UT students.

We exported the data of 45 responses to Google Sheets, created dummy variables for categories such as “classification” and “ordering days”, and utilized pivot charts to examine our user demographics and behavioral qualities (see left for examples).

The majority of our respondents were juniors and seniors from the Mccombs School of Business and the College of Natural Sciences (CNS). DoorDash was the most popular app (34.8% of users), though GrubHub and UberEats were not that far below (30.4% and 23.9%, respectively). The data also revealed that a typical delivery was ordered for 2 people on weekend days and average spending was $26.

While the visualizations helped us organize counts and distributions, they were not particularly useful for classifying our respondents into targetable market segments. Therefore, we exported the spreadsheet to IBM SPSS, a statistical software package, to run a more thorough analysis.

A. FACTOR ANALYSIS - Before we could begin segmentation, we needed to reduce our survey variables to the most relevant factors and identify the app characteristics that consumers valued most.

Variables used:

- App of choice
- App usage frequency
- How much do you value (1-10):
  - Accurate delivery time
  - Discounts and rewards
  - Customer service
  - Intuitive app interface
  - Order tracking
- Typical spending ($) per order
- Typical order size (1-3 people)
- How much do these influence your decision to order delivery:
  - Meal time
  - Event type / Social Gathering
  - Cooking substitute
  - Day of the week
  - Cuisine type

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.567	17.115	17.115	2.567	17.115	17.115	2.236	14.907	14.907
2	1.886	12.570	29.685	1.886	12.570	29.685	1.950	12.997	27.904
3	1.813	12.089	41.774	1.813	12.089	41.774	1.744	11.629	39.533
4	1.661	11.075	52.849	1.661	11.075	52.849	1.689	11.262	50.794
5	1.360	9.070	61.919	1.360	9.070	61.919	1.669	11.124	61.919
6	.968	6.453	68.371						
7	.885	5.898	74.269						
8	.844	5.624	79.893						
9	.748	4.984	84.877						
10	.640	4.265	89.142						
11	.526	3.509	92.650						
12	.404	2.692	95.342						
13	.330	2.199	97.541						
14	.238	1.588	99.129						
15	.131	.871	100.000						

Extraction Method: Principal Component Analysis.

Based on Eigenvalues > 1, we extracted five components from fifteen (which together explained 61.92% of the variance), and saved the factor scores as variables FAC_1, FAC_2, etc.

Correlations

		REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 5 for analysis 1
REGR factor score 1 for analysis 1	Pearson Correlation	1	.000	.000	.000	.000
	Sig. (2-tailed)		1.000	1.000	1.000	1.000
	N	45	45	45	45	45
REGR factor score 2 for analysis 1	Pearson Correlation	.000	1	.000	.000	.000
	Sig. (2-tailed)	1.000		1.000	1.000	1.000
	N	45	45	45	45	45
REGR factor score 3 for analysis 1	Pearson Correlation	.000	.000	1	.000	.000
	Sig. (2-tailed)	1.000	1.000		1.000	1.000
	N	45	45	45	45	45
REGR factor score 4 for analysis 1	Pearson Correlation	.000	.000	.000	1	.000
	Sig. (2-tailed)	1.000	1.000	1.000		1.000
	N	45	45	45	45	45
REGR factor score 5 for analysis 1	Pearson Correlation	.000	.000	.000	.000	1
	Sig. (2-tailed)	1.000	1.000	1.000	1.000	
	N	45	45	45	45	45

We also ran a correlation matrix to check for any existing relationships among factors. Since the correlation values between factor scores were all 0s, we determined that components were independent of each other and that we could use an orthogonal, Varimax rotation.

Using the Rotated Component Matrix for the 5 components and 15 survey variables, we developed user personas based on the significantly positive and negative factor loadings.

Personas	Characteristics
FAC_1 "The Occasional Users"	• **Does not use delivery apps often (**factor loading of -0.249). • **No particular values with usage**, indicated by negative loadings for delivery time, customer service, etc.
FAC_2 "The Bargain Hunters"	• **Orders for many people** (loading = 0.654) and values customer service (0.699) and app interface (0.411). • Group that most values **discounts and rewards,** with a loading of 0.442.
FAC_3 "The Party Planners"	• **Uses apps frequently** (0.620, the highest loading of the 5 factors) • Not influenced by day of the week (-0.295) • Associated with **social gatherings** (loading = 0.669) • Values **accurate delivery time** the most (0.605)
FAC_4 "The Solo Eaters"	• Most influenced by an app's **cuisine offering** (0.553, the highest loading of the 5 factors) and most likely to use delivery apps as a **cooking substitution** (loading = 0.373) • Values order tracking/communication the most (0.838) • Individuals **typically ordering for themselve**s (0.006) and **not influenced by social gatherings** (-0.124)
FAC_5 "The High Spenders"	• Of the five groups, has the **highest loading for spending (0.811)** • **Not influenced by day of week (-0.707)** • Mostly values easy-to use app interface (0.590)

B. CLUSTER ANALYSIS - After converting the most important app attributes for different users into factors, we used cluster analysis to classify our survey respondents into mutually-exclusive segments.

Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
40	7	8	123.031	37	26	44
41	3	10	140.973	39	35	43

First, we used SPSS' Hierarchical Clustering method to determine the optimal number of clusters. Based on a table of cluster distance coefficients (see left diagram), we located a large "jump" in values from observation 40 to 41. This would be considered an "elbow" (curve point) if graphed on a Scree plot.

Using the elbow method of clustering, the number of clusters (k) = number of cases - the elbow observation. Hence, the ideal number of clusters would be 45 responses - 41 = 4 clusters.

Final Cluster Centers

	Cluster			
	1	2	3	4
REGR factor score 1 for analysis 1	.29354	.14664	.19868	-.78550
REGR factor score 2 for analysis 1	-.11575	-.62503	1.43396	-.06815
REGR factor score 3 for analysis 1	.14876	.52519	-.08121	-1.11794
REGR factor score 4 for analysis 1	-.72198	.33035	.28582	-.22454
REGR factor score 5 for analysis 1	1.35498	-.46657	-.11125	-.31057

Next, we applied k-means clustering to our dataset (with k=4) and used our five factor scores as the variables. The number of observations in clusters 1-4, were: 9, 18, 9, and 9, respectively. The matrix values were standardized differences from the overall mean, or with which persona each cluster identified most.

Conclusions based on the final cluster centers:

- Cluster 1 identified most strongly with FAC_5, “The High Spenders”.
- Cluster 2 was linked to FAC_3 “The Party Planners”.
- Cluster 3 identified with FAC_2, “The Bargain Hunters”.
- Cluster 4 was not as clearly labeled as the other three, but appeared to be associated with FAC_2 and FAC_4.

RECOMMENDATIONS

Table 1: Target Market Selection

	Size	Profitability	Accessibility	Frequency	Total
Cluster 1	3	5	5	4	**16**
Cluster 2	5	5	5	5	**20**
Cluster 3	3	1	5	2	**11**
Cluster 4	3	2	5	2	**12**

-estimations based on output from factor-cluster analysis.

Cluster Analysis was used to segment and classify food delivery users on the basis of similarities in service preferences. As it is not feasible to target all four clusters, it is necessary to evaluate each cluster on size, profitability, accessibility, and purchase frequency to determine the most attractive target market. Based on the calculations in Table 1, it is recommended that GrubHub target Cluster 1 and Cluster 2 as they represent the highest earning potential.

CLUSTER 1: "The High Spenders"

The first cluster, "The High Spenders", accounts for 20% of the sample population.
Its Factor 5 score of 1.35 indicates that this cluster spends more than average on food delivery services. It is also worth mentioning that this group is not influenced by day of the week. This indicates that this segment makes more frequent purchases throughout the week, thus representing a more consistent consumer. It also suggests that this segment could be more receptive to promotions at any point in time, whereas other clusters might use delivery services on certain days of the week. Since this group highly values an intuitive app interface, GrubHub must ensure that their app delivers a seamless user experience. It is also critical that they promote the app itself in order to increase awareness of the app to "The High Spenders" cluster. Since this segment is spending significantly more than the other clusters identified, GrubHub should divert resources to targeting and capturing this piece of the market.

CLUSTER 2: "The Party Planners"

The second cluster, "The Party Planners" accounts for 40% of the sample population.
Its Factor 3 score of 0.53 affirms that this segment uses delivery services the most frequently of the four clusters. With a higher purchase frequency, this segment is an attractive target for GrubHub in terms of both loyalty and profitability. Since this group also held the largest score for social gatherings, this indicates that this cluster orders for events or friends. This also suggests this segment represents potentially larger order quantities than the other clusters, thus a higher spending probability. This group highly values delivery time accuracy, so GrubHub must ensure they are satisfying this need. Similar to Cluster 1, this segment also is not influenced by day of the week and therefore a much more consistent consumer of delivery services.

TARGET MARKET

In 2021, roughly 4.5 million US students will be graduating from college. This means a vast majority of these individuals will be entering the workforce, equipping them with a much greater disposable income. It is also worth noting that, in some states, individuals with degrees make up to 160% more than those without a degree[4]. Therefore, this segment offers a highly profitable

[4] Miller, Celia. "College Enrollment & Student Demographic Statistics." *EducationData*, 1 Mar. 2021, educationdata.org/college-enrollmentstatistics#:~:text=16.4%20million%20or%2075.1%25%20of,%3B%2021.1%25%20attend%20private%20institutions.&text=4.43%20million%20college%20students%20are,24.6%25%20will%20receive%20associate's%20degrees.

subset of individuals with high lifetime value potentials. This segment still exhibits relatively high spending behavior, with the average college student spending almost $100,000 over the span of their degree. Food delivery services must capture the loyalty of these users now and focus on retaining them for the long-run. By targeting college students, GrubHub can gain the upper hand on its competition by building trust and meeting the segments' needs.

GENERATION Z

With their purchasing power exceeding $140 billion and their influence driving an additional $300 billion in spending, Generation Z is the fastest-growing consumer demographic with distinct attributes driving their purchase behavior. For purposes of this study, Gen Z is considered to include those born between the years 1995 and 2005. With 93% of Gen Z expressing a strong interest in pushing for sustainable practices and healthier food options, this demographic provides GrubHub with an untapped competitive advantage in the industry[5]. These consumers want to engage with companies who use their platform to encourage environmental improvements, support locally owned businesses, promote sustainability, and operate transparently.

In addition to Gen Z's focus on sustainability, they also prioritize health when making food decisions. A study performed by the Institute of Emerging Issues at NCSU revealed that, in addition to prioritizing healthier food choices, they are willing to pay more to acquire them as well[6]. To capitalize off of these needs, GrubHub must incorporate these values into their current business offering.

In their current app, it is recommended that the filtering feature be expanded to include the following filters: "sustainable practices", "healthy options", "allergen-friendly", "local company", "eco-friendly packaging", and "calorie-conscious menu". In addition to altering the filtering feature, it is recommended that the app display estimated delivery times for each

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[5] LoDuca, Isabel. *Why Gen Z Voices Matter in Making Business Sustainable*. 19 Oct. 2020, www.greenbiz.com/article/why-gen-z-voices-matter-making-business-sustainable.

[6] Su, Ching-Hui Joan, et al. "U.S. Sustainable Food Market Generation Z Consumer Segments." *Sustainability*, vol. 11, no. 13, 30 June 2019, p. 3607., doi:10.3390/su11133607.

company instead of waiting until checkout to reveal the information. This adjustment will satisfy both the needs of "The High Spenders" and the "The Party Planners". With the delivery times displayed initially, this will provide a seamless transaction and improve the intuitive nature of the app.

IMPLEMENTATION

To effectively reach this demographic, social media must be the primary source of promotion. With 39% of Generation Z using over 4 social media accounts, influencer marketing has proven to elicit a significant ROI. When making purchase decisions, college students value authenticity and transparency[7]. Research suggests that influencer recommendations have spurred purchases by roughly half (44%) of Gen Z. Additionally, consumers are 2.5 times more likely to perceive influencer-generated content as transparent when compared to brand-generated content. With the bulk of Gen Z engaging with multiple social media outlets, a multi-channel strategy will optimize exposure efforts. Promotional spending should be allocated to influencer marketing through the social media platforms with the highest Gen Z engagement; Instagram, TikTok, and Snapchat. In these promotions, influencers will emphasize the seamless app interface to appeal to "The High Spenders" and the pre-order features that GrubHub offers to address "The Party Planners" need for accurate delivery times. This promotional style will address the needs of its target audience through a channel that they trust.

In addition to social media promotions, it is critical that GrubHub strengthen its online presence and brand image. Research indicates that 70% of customers trust peer reviews over brand-generated content[8]. We recommend implementing an incentive, such as a free delivery, to leave a review on the app or website in order to build brand reputability and gain further insights to user needs. To capitalize off of the high trust of peer recommendations, we also suggest a referral-based incentive. This could look like a free delivery when you and a friend sign up for the rewards program or create an account through the app. With the easy access provided by

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[7] Williams, Robert. "Gen Z Relies on Influencers for Purchase Decisions, Kantar Says." *Marketing Dive*, 2 Mar. 2020, www.marketingdive.com/news/gen-z-relies-on-influencers-for-purchase-decisions-kantar-says/582890/.

[8] "User Generated Content For Your Higher Education Marketing." *Unibuddy*, 16 Jan. 2020, unibuddy.com/blog/user-generated-content-higher-education/.

the app, this will increase the likelihood of repeat purchases and also enable the brand to directly notify the user of promotions through the app.

CONCLUSION

As a substitute for the demographic-based segmentation tactics, the combination of factor and cluster analyses allows brands to predict customer behavior by subdividing the market into actionable targets. This technique provides insights to the intrinsic motivations behind the customer decision process that a demographic approach is unable to offer.

In running our analyses, marketers can now identify attitudinal variants and construct target-specific strategies for customer acquisition and retention. In order to capture "The High Spenders" and "The Party Planners", GrubHub should implement promotional strategies that cater to the preferences of these segments. In doing so, GrubHub can acquire a highly profitable market segment that will likely translate into long term customers with an even greater purchasing power.

LIMITATIONS AND FUTURE RESEARCH

To gain an insight into the food delivery preferences of the college demographic, this study surveyed a sample of students attending the University of Texas at Austin. Although the study revealed significant findings, potential limiting factors must still be addressed. Due to limitations on time and access, the sample was not truly randomized. The survey respondents were peers from group chats and class discussion boards, predominantly composed of business (43.5%) and science (32.6%) majors, so our sample did not encompass the preferences of the entire student body. Moving forward, the survey should be administered to a more diverse range of majors in order to obtain a more representative sample. An additional bias exists, as the perceptions and behaviors of students of one university cannot be generalized to encompass all students across the country. To mitigate this bias, additional surveys should be implemented to schools across the country. Socioeconomic differences among respondents might also impact their spending behavior and preferences. Thus, future research should incorporate economic factors that may influence attitudes towards food delivery services.