Customer Preferences on Delivery based on Data Analysis

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ABSTRACT
Currently, there are many delivery formats rising. Food delivery company needs to find out which factors of delivery values the most. In this paper, the relationship between customers' background depending on four background factors: age, gender, educational qualifications and their delivery order preferences. Based on four factors: freshness, discounts and promotions, politeness by driver, the store and the customers services, and time saving are discussed. The goal of this paper is to let the delivery companies have better option on adjusting their business strategies. In addition, this paper will make it clear that what customers will value when ordering a delivery.

Keywords: *Data Analysis, Food delivery, Delivery data, Customer Predictions*

1. INTRODUCTION

In delivery analysis, large companies do them to find the priority of customers, customer segmentation or they can adjust their business strategies to make a larger revenue.

In India's metropolitan centers, such as Bangalore, there has been an increase in the demand for online delivery. The question of why there has been such a rise in demand has long remained unanswered. As a result, a survey is conducted, and the results are reported.

The Delivery Analysis finds the most cost-effective hydrogen delivery alternatives and lays the groundwork for future research into alternate storage and transportation options. Furthermore, delivery analysis aids technological feasibility study in establishing the most efficient production capacities and locations. As inputs to other technical parts of the Program, delivery analyses will be done to find the most promising technologies.

In this paper, the relationship of customers' choice against their delivery order preferences are discussed and hoping to draw conclusions as well as providing corresponding suggestions for future operating strategies. In India, with population of over 1.3 billion, is undoubtedly a big consumer market across the globe. [1] The purpose of this paper is to find out whether there is a regulation between customers' background information and what they value the most in receiving delivery services.

2. METHODOLOGY

2.1. Data collection

The data was collected by surveys conducted by Ben Roshan, a student from Jain University. The method adopted to determine which background information is important is that whether it differs from national level largely. If it differs from national level largely, it proofs that there is a tendency going on in that background. After finding the background information that changes the market preferences, the changes of four important delivery factors were analyzed based on their background factors, to see whether delivery factors change based on background factors.

2.2. Data analysis

In dataset, participants were 388 people, while 222 of them are male, and 166 of them are female. In Figure 1, the number of males and females were counted. For gender ratio, it is determined that male tend to order more than female.

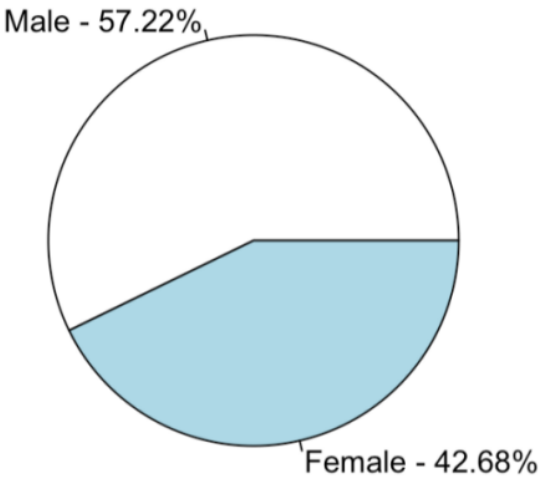

Figure 1: Pie chart of number of males vs. females.

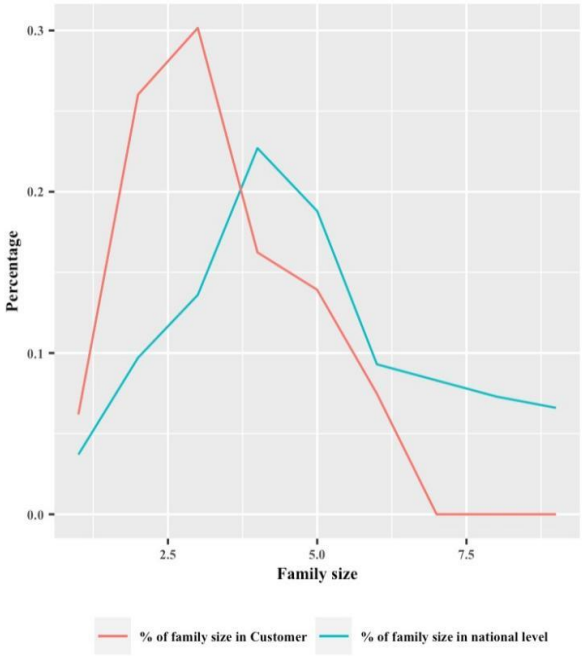

Figure 2: Percentage of family size in food delivery customer vs. national level.

From Figure 2, the graph showed relationship between customers number and family size. It is easily to tell that the difference between percentage of national level and customers. By comparing them, it is shown that two lines are slightly different. Thus, we compared the statistics distribution between two group of people.

The delivery graph in Figure 2, red line, has showed that it is shifted to left from the blue line, with higher maximum. Comparing with statistics reported by census, family size in national level and customer background has relations.

Not definite but showes some similarities with correlation in the results: 0.49196069.

The linear regression line for family size y is:

$$y = 98.69 - (11.12)x + \varepsilon \quad (1)$$

Where x is the family size.

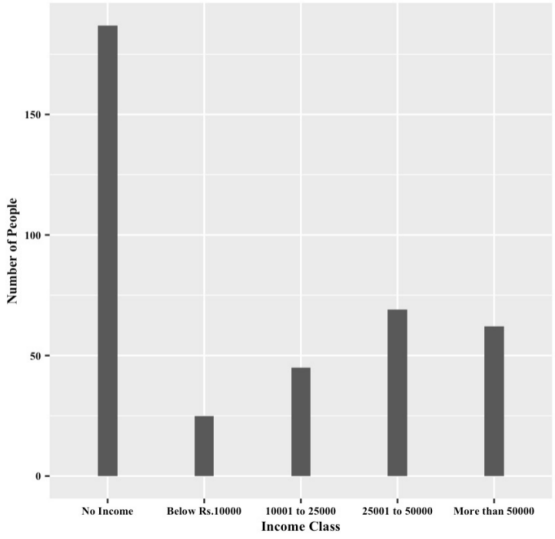

Figure 3 Income of customer of delivery services, with no income students.

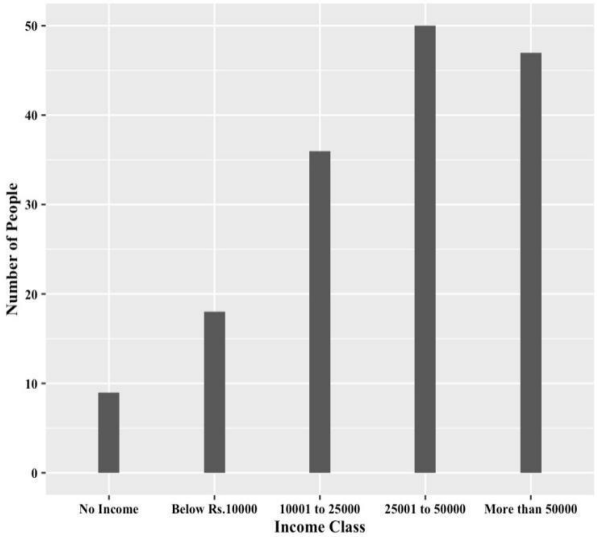

Figure 4: Income of customer of delivery services, without no income students

In Figure 3, students without income were included as sample, while Figure 4 has excluded them. For both graphs, x axis is their income level and y axis is the number recorded. Comparing two graphs, it showed that students without income is a large portion of the market.

3. DISCUSSION

3.1. The relationship between customer number and their gender

Based on Bangalore city sex ratio, 52% of people were reported as male [2]. Thus, there is 5.22 % more in contribution of males in market. Since there was only 5.22% different in male's ratio compared to national level. It is concluded that males tend to order more than females. And, gender is one of the background information factor.

3.2. The relationship between customer's background and educational background

Looking at the surveys furthermore, most of the educational background is that they are somehow educated or pursuing one currently. Although, in educational background, male and female showed significant difference. For Male, 110 out of the 222 surveys reported them as bachelor's holder or pursuing one. But for female, only 67 of 166 surveys were reported as bachelor's holder or pursuing one, when 93 were reported as master's or higher or currently pursuing. Thus, the higher demand in people who has higher educational degree in female was showed. Combining them, the survey showed that 45.62% of the customers hold bachelor's degree or pursuing.

According to the census in India, 86.11% of Indian population hold bachelor's degree, when only 12.07% of the population holds master's or higher [3].

Comparing these two statistics that, it is obvious that these two-percentages unmatched greatly. Thus, it is likely that educational background and customer background is related.

3.3. The relationship between household size and number of customers

Based on human nature assumption, as family size increases, the demand for food delivery would increase. But will it really increase?

To find whether there is a relationship between family size and food delivery demand, the number of orders were compared to the number of family size per household. And to truly determine that the regression line is based on customers' demand, another dataset from census is also used. When the average family size is determined to be 3.280928, the average household family size in national level is 4.4 [4], and with 4 members in a family at most [5].

Since, Figure 3 and Figure 4 are related and similar, the conclusion is made that family size only has slight changed from national level, thus our datasets are well distributed, and family size would not be one of the information factors.

3.4. The relationship between household income and customer background

In the survey reported, there were 5 different monthly income classes; No income, below 10000, 10001 to 25000, 25001 to 50000 and more than 50000. (All currencies are in Indian rupee).

While comparing the numbers from each bracket, the number of No income has out scaled any other income class level, having 48.20% of total customer.

Since, 95.69% of the No Income bracket was student, it proofs that student are most people who order the food delivery. (Figure 3)

If those no income students are excluded, the distribution changed hugely proving that there is significant relationship between income and number of customers. Looking at Figure 4, as monthly income raises from left to right, the number of customers raises greatly. Although, there were more people who earn 50000 or more than people who earn between 25001 to 50000. But it is believed to say there are not as many as people who earn between 20001 to 50000 compared to people who earn more than 50000 since the average monthly salary is around 16,000 in Indian Rupee [6]. Thus it is clear that the relationship is not caused by the national monthly income distribution and there is a strong proof that as salary goes higher, people tend to order food delivery, but when the income reaches to maximum level, the demand declines.

This research made it clear income level is normally distributed except student since the importance of factors like information quality, performance expectancy, effort expectancy and social influence must be understood in order to lead customers and food delivery apps have associated significantly with continuous use intention among young adults.

Thus, monthly income may not be one of the information factors.

3.5. Relationship between age and customer

The highest age of sample was 33 while 18 being the lowest. Since there was no age over 33, it was concluded that age is one of the information factors since this is much different from national level.

4. WHAT DO CUSTOMERS CARE IN FOOD DELIVERY EXPERIENCE?

Based on the survey, customers were asked to report what they think is important. Rating from 0 to 100, where 0 being Unimportant, 25 being not very important, 50 being neutral, 75 being important and 100 being very important.

There were 4 major rating categories, such as: The time they can save by ordering food delivery, the discount and offers they can use for orders, the quality of food such as freshness, and the politeness, such as the attitude of driver, restaurant, and customer services.

The average score is the following: 64.99 for more discount and savings, 68.62 for time saving, 71.39 for quality of food, and 71.64 for politeness.

By reading these numbers, it is determined that the relationship between 4 factors is:

Politeness > quality of food > time saving > more discount and saving.

4.1. Important Two Factors: Politeness and Freshness

4.1.1. Politeness

As mentioned in last paragraph, customers value the politeness of delivery driver, the store and customer services more than anything else. To better fits customers need, some adjustments can be made based on data. According to Ha (2013), restaurants that provide delivery service use unprofessional deliverymen and impacts negatively on the overall performance [7].

(1) In Gender

Looking at who has voted 75 or more on this section, 57.97% of them were male, and 42.03% of them are female. Comparing to our initial data with gender, the percentage of total male in our sample is 57.22%, which is very similar to vote result.

(2) In Educational Background

Looking at educational background, two major group has voted 75 or more, Bachelor's holder and Master of higher. Bachelor's participants have reported 49.28% of 75 or more, and master's or higher has reported 42.75% of 75 or more. Comparing to the educational background in whole data, when bachelor's was 45.62% in total participants, and 44.85% of master's or higher in total participants, there is decrease in 3.68% of bachelor's and increase in 2.13% in masters or higher. It is explained the with higher education, people tend to demand better services. Since Ego development is an implicit aim of higher education and can be one of its most significant results [8], it is explained that people with higher education have higher ego, thus they care the quality of service more than others.

The regression model for

$$y = 73.0339 - 1.38172(X_1) + 0.09275(X_2) + \varepsilon \quad (2)$$

Where X1=1 if master's s holder and X2 =1 if Ph.D. Holder.

(3) In Age

There was a significant relationship between age and demand in politeness. The research result showed that with age gets higher, the demand for politeness increases.

With the regression formula, y as demand.

$$y = 49.6238 + 0.9437X + \varepsilon \quad (3)$$

Where X is the age of customer.

4.1.2. In Freshness

Freshness was the second most important factor. Condition of food delivered. Fresh, well-cooked and well-presented are important food characteristics for the customers to be satisfied and reorder [9].

(1) In Gender

Looking at who has voted 75 or more on this section, 54.14% of them were male, and 45.86% of them are female. Comparing to our initial data with gender, the percentage of total male in our sample was 57.22%, and 42.78% in female, the result of female increasing 2.9% has showed that female has higher demand in freshness than males do.

(2) In Educational Background

In educational background, 57 of bachelor's holder had voted on the freshness is important, while 70 of master's or higher has voted on it is important. Looking at educational background, still two major group has voted 75 or more, Bachelor's holder and Master of higher. Bachelor's participants have reported 42.8% of 75 or more, and master's or higher has reported 52.63% of 75 or more. Comparing to the educational background in whole data, when bachelor's was 45.62% in total participants, and 44.85% of master's or higher in total participants, there is decrease in 2.82% of bachelor's and huge increase of 7.78% in masters or higher.

(3) In Age

In age, the result had showed significant difference on how people would assume. People might assume that with higher age, their demand for quality of food might increase. But it did not. What was found is that the with younger or older age, they demand higher freshness, that is being said when customers are mid age (23-28 years old), they tend to have less demand on freshness.

The regression model therefore is created as y as score, thus

$$Y = 83.0974 - 0.3912X + \varepsilon \quad (4)$$

Where X is the age of customers.

4.2. Unimportant factors (Not valued as high as other two factors)

4.2.1. Time Saving

In today's fast paced life, people would like to make sure their time has been fully utilized, thus online consumers perceive that timesaving is an important factor. [10] But in order to prioritize important factors, time saving is one of the scarifications that can be made. Time saving was second most unimportant factor concluded by previous analyzation. For time saving, the participants who has voted 50 or lower are selected from whole sample for analyzing.

(1) In gender

In gender, 60% of males have voted it as not important while 40% of female has voted it as important. Comparing to our initial data with gender, the percentage of total male in our sample was 57.22%, and 42.68% in female, the result of males has increase in 2.78%. Which has made no big difference. But it is telling us that female consider time saving more important than males do.

(2) In educational backgrounds

In educational backgrounds, the resulted data has showed something that did not happen before. Bachelor's holders have 55.56% thinking time saving is not an important factor, while master's or higher has 40% thinking time saving is not an important factor. Comparing to the educational background in whole data, when bachelor's was 45.62% in total participants, and 44.85% of master's or higher in total participants, percentage of bachelor's holder showed a significant increase of 9.94% when percentage of masters of higher has showed decrease in 4.85%. In other words, holders of master's or higher tend to value their time more than holders of bachelor's do.

(3) In Age

The regression formula is created as Y = score, thus

$$Y = 3.71868 - 0.01978X + \varepsilon \quad (5)$$

Where X is the age.

In age, the results showed that participants from mid age (23 – 28 years old) has less demand on time saving. In other words, with younger or older customers, they consider time saving as a factor more than mid age participants do.

4.2.2. In discounts and offers

Discounts and offers was most unimportant factor out of four factors.

(1) In gender

In gender, 62.3% of males have voted it as not important while 37.7% of female has voted it as unimportant. Comparing to our initial data with gender, the percentage of total male in our sample was 57.22%, and 42.68% in female, the result of males has increase in 5.8 %. Which tells some deference that males tend to care less on discount and savings.

(2) In educational backgrounds

In educational background, 52.46% of bachelor's degree holder has voted it as unimportant, where 45.9% of holder of master's or higher has voted it as unimportant. Comparing to the educational background in whole data, when bachelor's was 45.62% in total participants, and 44.85% of master's or higher in total participants, percentage of bachelor's holder showed a significant increase of 6.84% when percentage of masters of higher has showed small increase in 1.05%. In other words, holders of master's or higher tend to care about discounts and possible offers than bachelor's holders do, but not as much as other delivery factors.

(3) In Age

The regression formular follows, y = score. Thus

$$Y = 8.6725 - 0.1692x + \varepsilon \quad (6)$$

Where x is their age.

In age, the results showed that participants from mid age (23 – 28 years old) has less demand on money saving. In other words, with younger or older customers, they care less on whether they can save money than mid age people.

5. CONCLUSION

The delivery analysis identifies the most cost-effective hydrogen delivery solutions and establishes the framework for future research into alternative hydrogen storage and transportation. Furthermore, delivery analysis aids in determining the most efficient production capacities and locations in a technological feasibility assessment, such as importance of freshness, time saving, politeness by provider and discounts.

The relationship between customers' backgrounds based on four factors, including age, gender and educational qualifications, and their delivery order preferences based on four factors, including freshness, discounts and promotions, driver politeness, store and customer service, and time savings, was reviewed. Some factors such as income level and family size were

excluded since they do not make big effect in analyzation.

Customers with a higher bar for delivery for youthful (18–22 years old) or older (28 years or older) people, women and people with higher education experience tend to have higher standard for their delivery experience. When it comes to prioritizing customers, a higher bar for delivery for youthful (18–22 years old) or older (28 years or older) people, women, and people with higher education experience is critical. Young males with higher incomes have shown a growing trend in eating out [11].

If scarifies are required, clients with a lesser level of education, those in their mid-twenties (23 to 28 years old), and men are less concerned with overall delivery quality.

AUTHORS' CONTRIBUTIONS

This paper is independently completed by Haotian Zheng.

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