

A Logistic Regression Model of Customer Satisfaction for Online Food Delivery Services

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ABSTRACT

Customer satisfaction is very important in today's competitive scenario. Without customer satisfaction, companies cannot imagine their survival. This paper used logistic regression to develop a customer satisfaction model for online food delivery services. Eight dimensions or variables have been considered: Better Discounts, Better Choice of Restaurants, Food quality, Packing of food, on time doorstep delivery, Customer service, Mode of payment and Pricing. From the study it is found that online food delivery service providers are lacking in the packing of food, on time door step delivery, customer service, and pricing.

Keywords: Logistic regression, Logit, Customer satisfaction, Online food delivery service, Better Discounts, Better Choice of Restaurants, Food quality, Packing of food, on time doorstep delivery, Customer service, Mode of payment and Pricing.

Introduction

Technology has influenced major industries and it has been observed that there is an impact on the food industry too. With the emergence of digitalization in India, many companies have entered into online food delivery services. For an online food ordering website or app is used to target the customer. Food delivery or pick-up option is given to the customers. Online food delivery service can be very beneficial for customer and marketers as well. Some food outlets focus on online food delivery services through online mediums just because it reduces the operational cost of companies. Online food delivery service providers mostly focus on college-going students, working couples and office goers.

Literature review

Jyotishman Das (2018) reveals in his study that Zomato provides better discount and better choice as compared to Swiggy, Food panda & Uber eats. The data is collected from the users of online food delivery services. There are four important factors i.e. Discounts, choices service and delivery are taken into consideration for customer satisfaction regarding online food delivery services. Data is collected from Pune city and personal interaction is done with the customer to take the actual feedback regarding customer satisfaction.

H.S. Sethu & Bhavya Saini (2016) elucidate that online food purchasing services help the students in managing their time better. In this research author investigated the student's perception, behaviour and satisfaction of online food ordering and delivery services. It is also found that ease of availability of their desired food at any time and at the same time easy access to internet are the prime reasons for using the services.

Rathore, Suryadev Singh, Chaudhary Mahik (2018) interpreted that mostly the youngsters are attached to the online food ordering and hence the elder people don't use these online services much as compared to the younger ones. The study highlights the fact that youngsters are mostly poised to use online food ordering services. The study also reveals that the price of the products, discounts and special offers have the most influencing factor on online food ordering. The second most influencing factor is the convenience; the next most influencing factor is on-time delivery. Fast food was fancied by most of the respondents in their choice of cuisines. The study also revealed that a major proportion of respondents use either Uber eats or Zomato to order their food online. It was also observed that a less percentage of respondents were inclined towards the use of Swiggy and Food Panda.

Mathews Joao Chorneukar(2014) concluded that the online food ordering system is basically to save the time of the customers especially when he/she has to invite people for any occasion. The chief reason of electronic ordering is convenience. The single most important attribute of electronic ordering is accuracy. This study found that online food ordering is reasonably popular among the residents of Bangalore city.

Nigel & Jim (2006) depicted that customer retention is a challenge in online business and requires higher levels of customer satisfaction. It is very difficult to retain customer for a long time in this competitive environment. An analysis of e customers is vital since customer satisfaction results in loyalty and customer loyalty is the basis of successful customer relationship.

N.Pakutharivu (2018) found that online food ordering has created a significant impact on the lives of people around the globe. There are many restaurants selling their food online and mostly focusing on online food delivering business. It is also said that internet plays a vital role in marketing. In today's scenario many companies are using internet to reach their customers.

Leong Wai Hong (2016) exhibited that the technological advancement in many industries has changed the business model to grow. Efficient systems can help improve the productivity and profitability of a restaurant. The use of online food delivery system is believed that it can lead the restaurant's business grow from time to time and will help the restaurants to facilitate major business online.

Hong Lan, et al, (2016) interpreted that online food delivery market is immature yet; there are some obvious problems that can be seen from consumers negative comments. In order to solve these problems, we can neither rely merely on the self-discipline of online food delivery restaurants nor the supervision and management of online food delivery platforms. Only by taking laws as the criterion, with the joined efforts of the online food delivery platforms and restaurants, the government departments concerned, consumers and all parties in the society, can these problems be solved and a good online take away environment can be created.

Objective of study

To develop A Logistic Regression Model of Customer Satisfaction for Online Food Delivery in Indore region.

Research Methodology

This is a descriptive study in which we have tried to find out customer satisfaction for online food delivery. The study used primary data which were collected in the field through a self-structured questionnaire. Data of 100 consumers is collected from Indore region. Convenience sampling was used to collect the data. Data were

analyzed using Statistical Package for Social Sciences (SPSS) version 20. The logistic regression model has been used to analyze the various factors that stimulate customer satisfaction. A Hosmer and Lemeshow Test was used to calculate the chi-square value to indicate how well the logistic regression model fits the data. Thereafter, logistic regression coefficients were estimated using the following likelihood ratio model;

$$\text{Log}_e \left[\frac{P(Y=1|X_1, X_2, \dots, X_8)}{1-P(Y=1|X_1, X_2, \dots, X_8)} \right] = \text{Log}_e \left[\frac{\pi}{1-\pi} \right] = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_8 X_8$$

$$= \alpha + \sum_{j=1}^8 \beta_j X_j$$

The estimated model is:

$$\text{Logit}(Y) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \dots + \beta_8 X_8$$

Whereby;

Y = Customer Satisfaction

X₁ = Better Discounts

X₂ = Better Choice of Restaurants

X₃ = Food quality

X₄ = Packing of food

X₅ = on time door step delivery

X₆ = Customer service

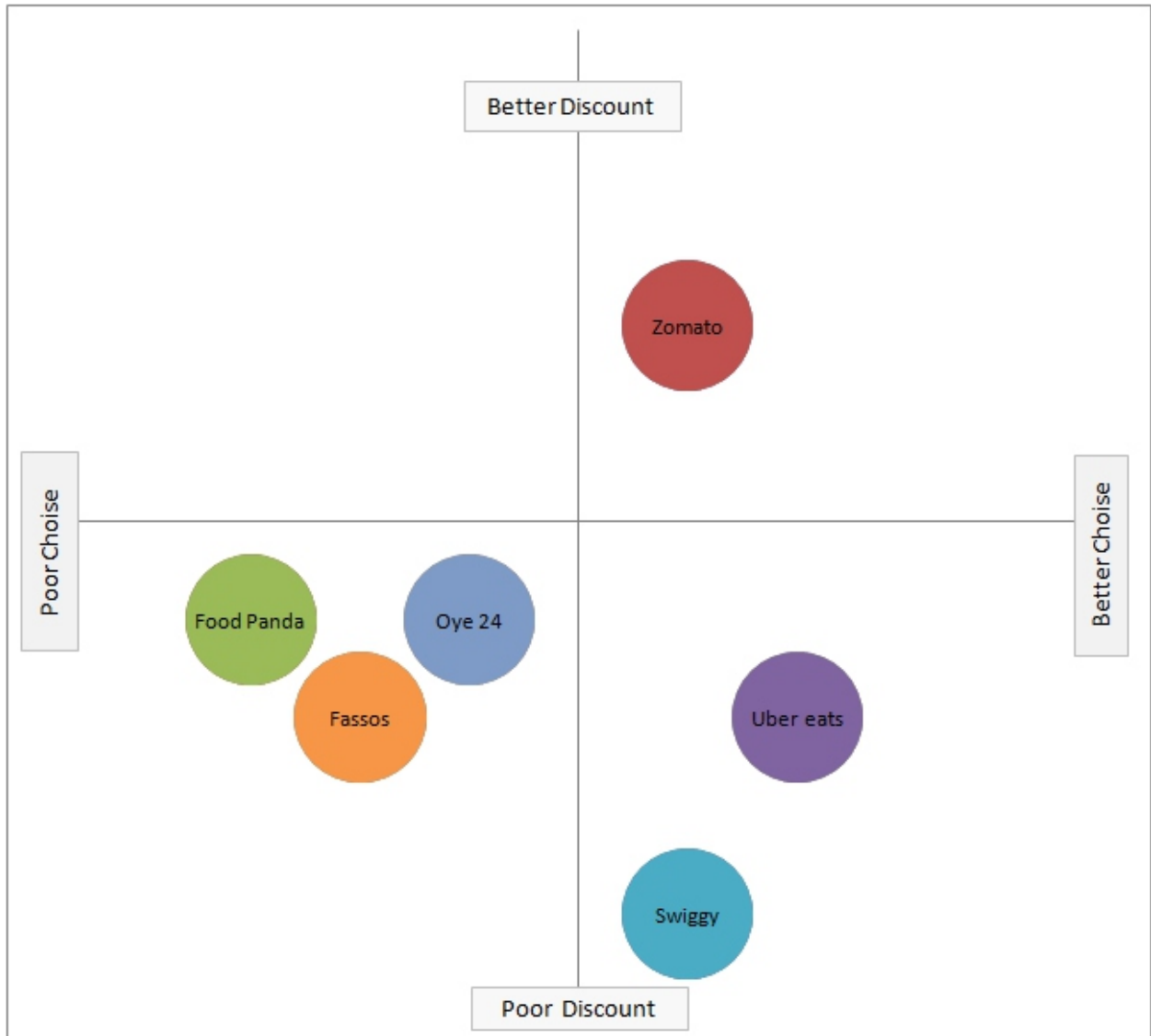
X₇ = Mode of payment

X₈ = Pricing

Data Analysis and Interpretation

Figure: -1 Positioning Study (Perceptual Map)

Perceptual Map is a graphical representation of the positioning of various brands on the mind of customers with respect to some major factors such as Better choice of restaurants, and Better discounts, etc. Here we have plotted the customer perception regarding the better choice of restaurants, and better discounts provided by online food providers.



Source: -Primary Data

Interpretation

From the above positioning study, it can be concluded that:

- ZOMATO is best in terms of providing better discounts and a better choice of Restaurants in Indore region.
- SWIGGY and UBER EATS are good in providing better choices but lag in terms of providing a better discount in Indore region.
- FOODPANDA, OYE 24 and FASSOS is poor in terms of both providing better discounts and a better choice of restaurants in Indore region.

Table: -1 Omnibus Tests of Model Coefficients

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	7.343	8	.000
	Block	7.343	8	.000
	Model	7.343	8	.000

Table: -2 Model Summary

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	130.927 ^a	.71	.95
a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.			

Table: -3 Hosmer and Lemeshow Test

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	66.942	8	.043

Eight variables (Better Discounts, Better Choice of Restaurants, Food quality, packing of food, on time doorstep delivery, Customer service, Mode of payment and Pricing) have been added to the model. By adding these variables, -2log likelihood (deviance) has reduced by 7.343 on 8 degree of freedom which implies that there are many variations of customer satisfaction. In Omnibus Tests of Model Coefficients by analyzing step & block the model found significant because the p-value is less than 0.05. This concludes that the additions of the independent variables to the model are statistically significant. Further, it can be interpreted that independent variables describe the changes in satisfaction. From table 2 model summary it can be interpreted that Cox & Snell R Square is .71 and Nagelkerke R Square is .95 which specify that the logit model which comprises the eight independents variables elucidates between 71% and 95% of the difference in satisfaction. A Hosmer and Lemeshow Test was used to calculate the chi-square value to indicate how well the logistic regression model fits the data. From table 3 it can be interpreted that the logistic regression model best fits the data.

Table: -4 Variables in the Equation

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Better Discounts	.116	.501	.053	1	.817	3.291
	Better Choice of Restaurants	.018	.234	.006	1	.937	2.182
	Food quality	.260	.454	.327	1	.567	1.297
	Packing of food	-.140	.148	.896	1	.344	.869
	on time door step delivery	-.155	.147	1.109	1	.292	.168
	Customer service	-.208	.148	1.979	1	.160	.231
	Mode of payment	.086	.185	.215	1	.643	1.090
	Pricing	-.267	.218	1.498	1	.221	.766
Constant	-.761	1.306	.340	1	.560	.467	
a. Variable(s) entered on step 1: Better Discounts, Better Choice of Restaurants, Food quality, Packing of food, on time door step delivery, Customer service, Mode of payment, Pricing.							

The Exp (B) column presents the odds ratio and indicates that Better Discount is 3.291 times more likely to make the customer satisfied than being dissatisfied. Better Choice of Restaurant is 2.182 times more likely to make the customer satisfied than being dissatisfied, Food quality is 1.297 times more likely to make customers satisfied than being dissatisfied. Moreover, Mode of payment was 1.090 times more likely to make customers satisfied than being dissatisfied.

The table 4 above shows that the estimated model is now:

$$\text{Logit}(Y) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \dots + \beta_8 X_8$$

$$\text{Logit}(Y) = -.761 + .116X_1 + .018X_2 + .260X_3 - .140X_4 - .155X_5 - .208X_6 + .086X_7 - .267X_8$$

Whereby;

Y = Customer Satisfaction, X₁ = Better Discounts, X₂ = Better Choice of Restaurants, X₃ = Food quality, X₄ = Packing of food, X₅ = on time door step delivery, X₆ = Customer service, X₇ = Mode of payment, X₈ = Pricing

From the model, it can be seen that Better Discounts, Better Choice of Restaurants, Food quality and mode of payment are positive related to customer satisfaction. Furthermore, since their odds ratio is greater than 1. Customer satisfaction has a negative relationship with Packing of food, on time doorstep delivery, Customer service and Pricing as its odds ratio is below 1.

Conclusion

From the study, it can be concluded that out of the eight independent variables four variables are negatively related to satisfaction of customer of online food delivery services. Better discount is the independent variable which makes most customers to be satisfied compared to others. Better Discounts, Better Choice of Restaurants, Food quality and mode of payment are positive related to customer satisfaction. Relationship between customer satisfaction and Packing of food, on time doorstep delivery, Customer service and Pricing are negatively related which implies that there is a need of improvement in strategies related to Packing of food, on time doorstep delivery, Customer service, and Pricing to improve customer satisfaction. The study recommends that the online food delivery service provider should provide a better discount because this is a very crucial variable for customer's satisfaction.

References

- Hong Lan, Li Ya nan & Wang Shuhua (2016), "Improvement of Online Food Delivery Service Based on Consumers Negative Comments", Canadian Social Science, Vol. 12, No. 5, pp. 84-88.
- H.S. Sethu & Bhavya Saini (2016), "Customer Perception and Satisfaction on Ordering Food via Internet, a Case on Foodzoned.Com, in Manipal", Proceedings of the Seventh Asia-Pacific Conference on Global Business, Economics, Finance and Social Sciences (AP16Malaysia Conference) ISBN: 978-1-943579-81-5. Kuala Lumpur, Malaysia. 15-17, July 2016.
- Jyotishman Das (2018), "Consumer Perception Towards Online Food Ordering and Delivery Services": An Empirical Study, Journal of Management, 5(5), 2018, pp. 155-163.
- Leong Wai Hong (2016), "Food Ordering System Using Mobile Phone", A report submitted to BIS (Hons) Information Systems Engineering. Faculty of Information and Communication Technology (Perak Campus), UTAR.

- Mathews Joao Chorneukar(2014)To Study the Customer Perceptions of Electronic Food Ordering, Thesis Pp.1-72.
- Nigel, H., & Jim, A. (2006). The Handbook of customer satisfaction and Loyalty Measurement (3rded.). Gower Publishing Company.
- N.Pakutharivu (2018) Customer satisfaction towards online food delivery with special reference to swiggy in coimbatore city IRJMESH Vol 10 Issue 4 (2019), pp 288-296.
- Rathore, Suryadev Singh, Chaudhary Mahik (2018) Consumer's Perception on Online Food Ordering, IJMBS Vol. 8, Issue 4, Oct - Dec 2018, pp. 12-17.