ORIGINAL RESEARCH PAPER

Statistics

A STUDY OF CONSUMER BEHAVIOR ABOUT PURCHASING BIKES

KEY WORDS: Hierarchical clustering method,Average linkage method

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ABSTRACT

In this paper study of consumer purchasing bike is carried out using classical techniques of data analysis and also exploratory data analyasis techniques.

INTRODUCTION

Indian bike industry is the largest in the world as far as the volume of production and sales are concerned. India is the biggest two-wheeler market on this planet and overall growth rate of 9.5 percent between 2008-16.Popular bike brands in India are Hero Motor Corporation, Honda, Bajaj Auto Limited Yamaha Motor Company, TVS Motor Company are the main brands available to customers. The price of different bikes from these companies ranges from 35,000-2,00000.In this paper behavior of consumer is studied about purchasing bikes.

Consumer means, " An individual who buy's products or services for personal use and not for manufacture or resale". A consumer is someone who can make the decision whether or not to purchase an item at the store and someone can be influenced by marketing and advertisements. Any time someone goes to a store and purchases a toy, shirt or anything else, they are making that decision as a consumer."The consumer includes both single person or a group of a persons. The group of persons may include business/ industrial/organizational consumers"

Consumer behavior is the study of individuals, groups, or organizations and the processes they used to select, secure, use, and dispose of products, services, experiences or ideas to satisfy their needs. In this paper main objectives under consideration are,to study the parameters which decide the behavior of consumer in purchasing bikes . To study and understand the "consumer behavior" about purchasing bikes.The study is based on observation and information gathered from consumer.The scope of study is limited to Amravati city.

METHODOLOGY

To study the consumer behavior a Questionnaire is made related to the study. In Amravati city, there are 5 showrooms of two-wheeler bikes of different companies such as Honda, Bajaj, Yamaha, Hero, TVS. The information is collected from the customers visiting the showrooms randomly.After filing up of questionnaire the data is analyzed using classical as well as exploratory data analysis technique.

ANALYSIS

Socio Economic Profile of the respondents

Among the respondents there are maximum persons in the age group 31-40 i.e 42.

It was observed that maximum respondents nature of work is mixed i.e. either travelling or desk job or both.Maximum respondents are graduate persons

In order to check proportion of consumers buying a bike first time .The hypothesis tested is

H_0: P = 0.5Vs H_1: P ≠ 0.5

To test this hypothesis R software(3) is used to estimate the proportion and 95% confidence interval is also estimated.

Large Sample Test

> prop.Test (43, 100, p=0.5)
1-sample proportions test with continuity correction
data: 43 out of 100, null probability 0.5
X-squared = 1.69, df = 1, p-value = 0.1936
Alternative hypothesis: true p is not equal to 0.5

95 percent confidence interval: 0.3326536, 0.5327873
Sample estimates: p =0.43

p value is 0.1936 which is greater than 0.5 hence we accept null hypothesis

Estimated value from data is p = 0.43and 95% confidence interval is (0.3326536, 0.5327873)

To test whether there is association between age group of respondents and whether they have full knowledge about bikes before purchasing applied chi-square test to the hypothesis

H_o:-There is no association between age group and full knowledge about bike before purchasing.

H_1 :- There is association between age group and full knowledge about bike before purchasing.

Age group * knowledge about bike Crosstabulation

Count		knowledge about bike		Total
		1	2	
Age group	1	22	6	28
	2	39	3	42
	3	19	11	30
Total		80	20	100

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.583[a]	2	.008
Likelihood Ratio	9.940	2	.007
Linear-by-Linear Association	2.259	1	.133
N of Valid Cases	100		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.60.

The result above table is p value is less than 0.05 i.e. Ho is rejected, this means that there is association between age group and full knowledge about bike before purchasing.

There are different factors affecting the quality of a bike apart from brand name, which has strong impact on the decision of consumers. To study this effect 6 factors affecting quality of 4 different brands were asked to rate by the respondents (Factors : variable name Fat A, Brand – Brand A). Factors were Milage, pick up, maintainance, look/shape, brand image. Brands were Here Honda, Bajaj, Yamaha and others. The hypothesis to be tested are using SPSS(2)

H0: Modal rating of the different brands are same Vs.H1: Modal rating of the different brands are not same

And H0: Modal rating of the different factor are same Vs H1: Modal rating of the different factor are not same

Univariate Analysis ofVariance

Between-Subjects Factors		
		N
Fat	1	4
	2	4
	3	4
	4	4
	5	4
	6	4
Brand	1	6
	2	6
	3	6
	4	6

Tests of Between-Subjects Effects					
Dependent Variable:Moderating					
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	31.667[a]	8	3.958	4.880	.004
Intercept	204.167	1	204.167	251.712	.000
Fat_A	26.833	5	5.367	6.616	.002
Brand_A	4.833	3	1.611	1.986	.159
Error	12.167	15	.811		
Total	248.000	24			
Corrected Total	43.833	23			
a. R Squared = .722 (Adjusted R Squared = .574)					

The result above table is p value corresponding to Fat A i.e. factor affecting quality is less than 0.05 and corresponding to Brand A is greater than 0.05, this means that :1) Modal rating of the different factor are not same.2) Modal rating of the different brands are same.

To analyze the behavior of consumer 9 attitudinal statements were asked to rank on 5 point Linkart scale . The statements were 1.In India, we have been able to achieve technological standard of high order 2. I prefer to buy made in India bikes 3. I usually buy things which provides value for money.4. Convienience is more important than style.5. I do not like wasteful expenditure 6. When it comes to safety i believe that there should be no compromises 7. I am saver rather than spender.8. I like to try new and different things .9.I always want to be a part of changing world. Average linkage method in Hierarchical clustering method from Exploratory data analysis is used (5)

Hierarchical clustering method Case Processing Summary[a,b]							
Cases							
Valid		Rejected				Total	
		Missing Value		Negative Value			
N	Percent	N	Percent	N	Percent	N	Percent
100	100.0	0	.0	0	.0	100	100.0
a. Chi-square between Sets of Frequencies used							
b. Average Linkage (Between Groups)							

Initial Cluster Centers			
	Cluster		
	1	2	3
a	4.00	4.00	2.00
b	5.00	3.00	1.00
c	2.00	5.00	5.00
d	2.00	1.00	5.00
e	3.00	2.00	5.00
f	1.00	5.00	4.00
g	1.00	5.00	5.00
h	1.00	5.00	1.00
i	1.00	5.00	2.00

Iteration History[a]		
Change in Cluster Centers		
1	2	3
3.150	.000	1.608
.000	.000	.000

a. Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is .000. The current iteration is 2. The minimum distance between initial centers is 7.681.

Distances between Final Cluster Centers			
Cluster	1	2	3
1	-	6.551	6.102
2	6.551	-	6.832
3	6.102	6.832	-

To test the effect of attitudinal statements ANOVA is carried out .

H_o : All the statements are having same effect on behavior.

ANOVA						
	Cluster		Error		F	Sig.
	Mean Square	Df	Mean Square	df		
A	15.169	2	1.310	97	11.583	.000
B	24.350	2	1.507	97	16.154	.000
C	81.290	2	.528	97	153.975	.000
D	79.276	2	.217	97	366.058	.000
E	49.520	2	.680	97	72.834	.000
F	85.796	2	.748	97	114.634	.000
G	78.120	2	1.043	97	74.878	.000
H	54.073	2	2.057	97	26.283	.000
I	58.661	2	.623	97	94.149	.000

Examining the F values from ANOVA. It can be observed that all the variables are significant at 5% level of significance and can be concluded that all the 9 statements are different and

hence can be used for interpretation.

Final Cluster Centers			
	Cluster		
	1	2	3
a	3.19	4.00	2.18
b	3.41	3.00	1.68
c	2.16	5.00	4.68
d	1.89	1.00	4.68
e	1.95	2.00	4.36
f	2.11	5.00	4.73
g	1.92	5.00	4.14
h	2.67	5.00	1.45
i	1.84	5.00	2.00

Three clusters were obtained and can be named according to the statements they favor. Cluster 1 is high on the variable 'I prefer to buy things made in India'. Thus we can call this as **patriotic customer.** Cluster 2 is high mainly on 'I always want to be a part of changing world', 'I like to try new and different things', 'When it comes to safety i believe that there should be no compromises', 'In India, we have been able to achieve technological standard of high order'. Thus we name these as **innovative customer .**Cluster 3 is high on 'I usually buy things which provides value for money', 'Convenience is more important than style', 'I do not like wasteful expenditure'. Thus we call this as **cautious customer.** This solution also gives summary table of the number of cases in each cluster.

Number of Cases in each Cluster		
Cluster	1	64.000
	2	14.000
	3	22.000
Valid		100.000
Missing		.000

After identifying the cluster membership of the members in a sample cluster profile was studied and results are Cluster 1 i.e. patriotic customers are maximum from age group

31-40.Cluster 2 i.e. innovative customers are maximum from age group 21-30.Cluster 3 i.e. cautious customers near about equal no from different age group 21-30, 31-40,41-50.Education wise all the clusters are having maximum graduates.All the cluster are having more customer of having both work type desk as well as travelling. Many respondents do work like M.R., LIC person, shop keeper, bank person.As we know cluster 1 contain maximum 64 customers out of 64 maximum respondents are married similar is case for cluster 2 and 3.Comparing the cluster occupation wise cluster 1 contains maximum self employed and in cluster 3 persons doing govt. or private jobs are more than clusters 1 and 2**.**

Findings

Understanding a consumer behavior in the present scenario is extremely important as it is no longer a simple task. Now the consumer is considered to be the King. He is the price maker and not price-taker. Earlier, there used to be a few two wheeler manufactures who held a monopoly. However , this situation has changed with the entry of other competitors, especially after liberalization saw production going up tremendously due to the availability of many alternative choices, consume r preference and needs changed. Suddenly, the buyer came into focus. Hence, this study makes an attempt to know the changes in the two wheeler markets and buying motives of two wheeler buyers. The study was conducted by using the surver method.

The study revealed the consumer preference and ownership pattern and the sources of information they used to make the purchase decision, and importance given to various evaluation criteria.Understanding consumer behavior or ''knowing customers'' is not easy. Customers may state their needs and want but act otherwise. They may not be in touch with their deeper motivation. They may respond to influences that change their mind at the last minute. Talking of the two wheeler industry, the names that effortlessly come to us is Hero Moto Corp, Honda, Bajaj Auto and others. T h e t w o wheeler segment has played an important role in giving a push to the automobile industry in India. In fact, the production, sales and experts of the two wheelers is a fair indication of the growing importance that it enjoys in this country's manufacturing economy. An overview of the two wheelers are among the most sought after automobiles in India for some time and the trend is likely to stay for a while.From the survey it was observe that 43% of the respondents are first time buyers of two wheeler bike. The estimated 95 % confidence interval is (0.3326536, 0.5327873) .From the survey we have obtained that there is association between age group and full knowledge about bike before purchasing.

The respondents were asked to rate 9 attitudinal statements on 5 point scale and the ranks were analyzed using agglomerative schedule of clustering.**Cluster 1Patriotic** :- This group composed of people of all age group but more from age group 31-40. Most of them are graduate, married, have income up to 2 lacks and are self employed.**Cluster 2Innovative** :- This group composed of maximum people of age group but more are from 21-30. Most of them having education graduate and above and single. Most of them have income more than 2 lacks.**Cluster 3Cautious** :- This group composed of people of all age group but more from the age group >30, graduate and most of them have govt. or private jobs.This group contains married as well as single members.

According to the rating given by the respondent to the 4 brands and 6 quality factors affecting decision of consumer we found that modal rating of factors are not same. From which we can conclude that decision of consumer depend upon various quality factor of different brand.

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