An Empirical Study of Pricing and Segmentation for the Touch Tablets in Indian Markets

R. S. Rai
Associate Professor, Department of Decision Sciences
Amity Business School, Amity University, Noida
Email: rsrai@amity.edu

Sandeep Manapragada
Business Development Manager,
S.B.I. Life Insurance Co.Ltd.
Kothagudem, Andhra Pradesh

Abstract

The world of electronics is very dynamic; before you are acquainted it changes the entire dynamics of the market. Before we wanted to estimate the smart phones and laptops properly the tablets are in the market. An exploration for answers regarding the tablets has been initiated and carried out by many researchers across and we are a part of this cult. We are destined to ascertain the ideal price for the tablet and the preferred configuration along with the requirements of the customer and see which segment is suitable for this product. We adopted quota sampling and collected samples from urban and suburban areas to have a clear understanding and we used tools like cross tabulation, Z-test, and discriminant analysis to have concrete results. We found out that there is some distinction between the requirements of Urban and suburban areas and Smart phones and laptops are very close to this product. The paper offers useful suggestions to the tablet industry while designing and targeting.

Introduction

Mobile Internet Devices are definitely setting the world on a move. Tablets are the latest and most advanced Mobile Internet Devices that entered the market and in the near future going to be one of the most dynamic and compelling gadget in the market. A Market research group powered by the Allied Business Intelligence Inc has found out that the nearly 90 million Mobile internet devices will be sold by 2012

(Associated Business Intelligence Inc., 2008). These astounding forecasts, no doubt, have far reaching implications on various product lines and even industries. For instance the success of the Tablet will be a definite threat for the Smart Phones, Laptops, Netbooks, and Notebooks etc. However among all, the telecom Industry will have a good business in terms of 3G and wireless Internet services. This device is going to extensively change the dynamics of the market.

Tablets is a very portable device with lot of strengths at the same time it had many drawbacks, when a survey was conducted to find out the desirability of tablet PCs over Laptops, many people are satisfied with the Laptops to handle their daily heavy duty (Ozok, Bensen, Chakraborty, & Norcio, 2008), This study revealed that people are highly satisfied with performance delivered by their laptops and tablets cannot deliver that performance. In another context the closest substitute or the competitor is the smart phone. So we intend to study about the competition along with segmentation and customer requirements in our project.

Review of Literature

Touch Tablets is undergoing a period of unprecedented change – new product, new entrants, mergers and acquisitions, downsizing, and now another new delivery channel, A study by (Ozok, Bensen, Chakraborty, & Norcio, 2008), indicated that computing capabilities and portability of Tablet PCs were impressive but majority did not prefer Tablet PCs to laptop PCs to meet their everyday computing needs. Further (Huberty, 2011), worked on different applications used by the users of laptops and mobile internet devices. The technical analysis performed in this paper was the basis of our technical analysis. We have taken some of the companies mentioned in this research paper for our competitor analysis. (Karjaluoto, 2006), in an investigation of 3G Mobile technologies and services has provided insights on the different applications of 3G for the mobile industry. As smart phones and tablets share similar features in terms of 3G applications, we have used them in constructing the questionnaire.

A brief awareness about capacitive touch, in particular multi touch capacitive screens and practical user experiences while using the touch screens with different font and page sizes were provided by (Colle & Hiszem, 2004). (Kwon, Choi, & Chung, 2011). provided an insight that, on increasing control-to-display gain it seemed to increase the usability of tap-n-drag, but excessively large gain is having the opposite effect on some measures such as task completion time, ease of use and overall preference. About the physical experiments conducted on children regarding desktops and tablet usage to find out musculoskeletal variations while using these devices (Straker, et al., 2008), has given us an understanding that even children can

be the target segment for the tablet PC. While (Ricadela, 2005) argued that tablet PCs are still in Niche Segment, we are determined to verify it . Further to help in analyzing the technical requirements of tablet PCs in India, (Strauss, 2008), gave a deep insight on the technical aspects of the mobile internet devices.

(Associated Business Intelligence Inc., 2008) predicts eight classes of consumers to be interested in the device, including multimedia enthusiasts, Generation Y Social Networkers and Lifestyle Boomers. However, earlier (Moskowitz, 1990), has provided with important information that the people are interested in laptops even when the desktops are offering better performances. We extended this research to find out whether people are interested in more portable tablets than laptops.

Research Methodology

Research Objectives:

The main objectives of this research project are mentioned below.

1. To find out the most preferred price and the configuration associated with it
2. To find out the customer requirements for the tablets
3. To find out a perfect segment for the tablets

Sampling for the Survey

Quota Sampling has been adopted for this study; the research has been conducted in the urban and in the suburban areas in order to find out the hairline differences between the level of requirements in the urban and suburban areas. The samples considered for the study are highly educated and some of the working class, particularly people with good technical awareness and having exposure on new technical gadgets.

The Sample size is selected as 200 which includes 100 individuals from each of urban and suburban areas.; in order to maintain the uniformity in the survey we have chosen equal numbers from each strata.

As described above, the sample size for the project is 200 and we have taken quota sampling, it is very important for this study that the respondents should have a fair knowledge on technical gadgets, terms and configurations, in the later part of study in order to reach such samples we have done some snow bowling techniques, Due to this very reason there will be more males and people between 20-35 years of age in the samples.

Analysis and Results

In order to find out the pricing, cross tabulations were plotted for different price ranges and the geographic and demographic details of the customer to have conclusive results. The details like Age, family Income, gender and region were considered for analysis. The following are the respective cross tabulations

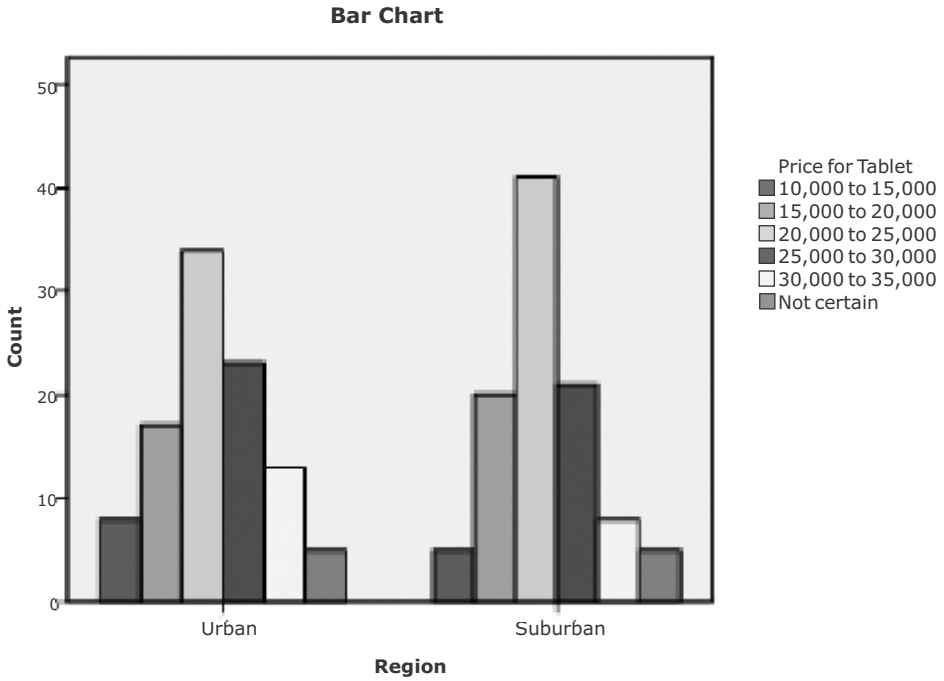

Figure 1: Region Vs Price

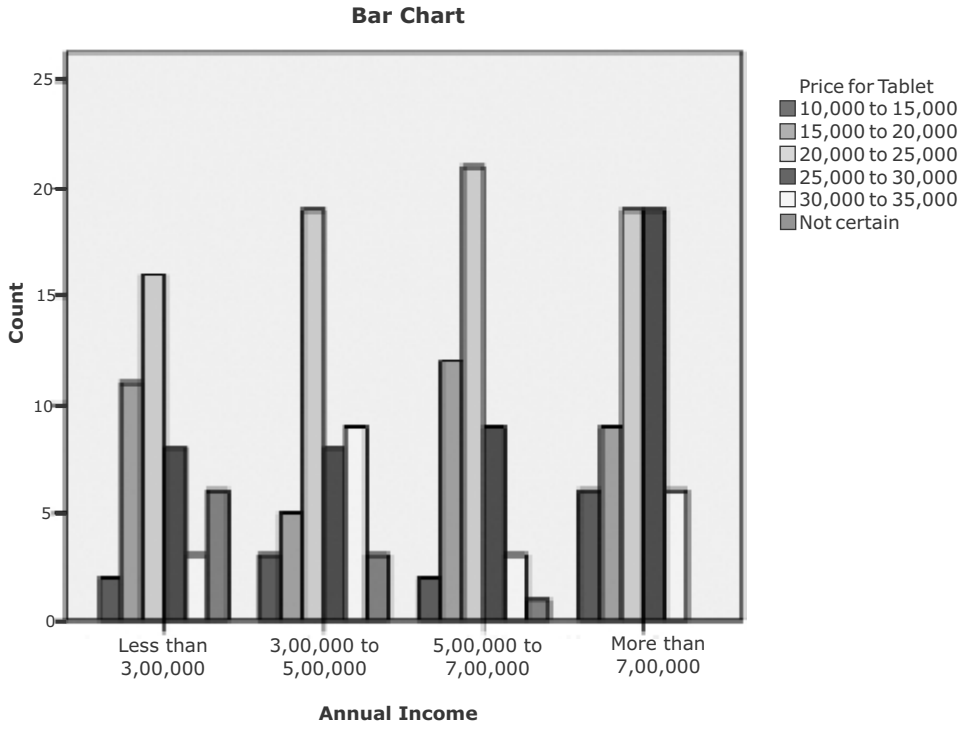

Figure 2: Annual Income Vs Price

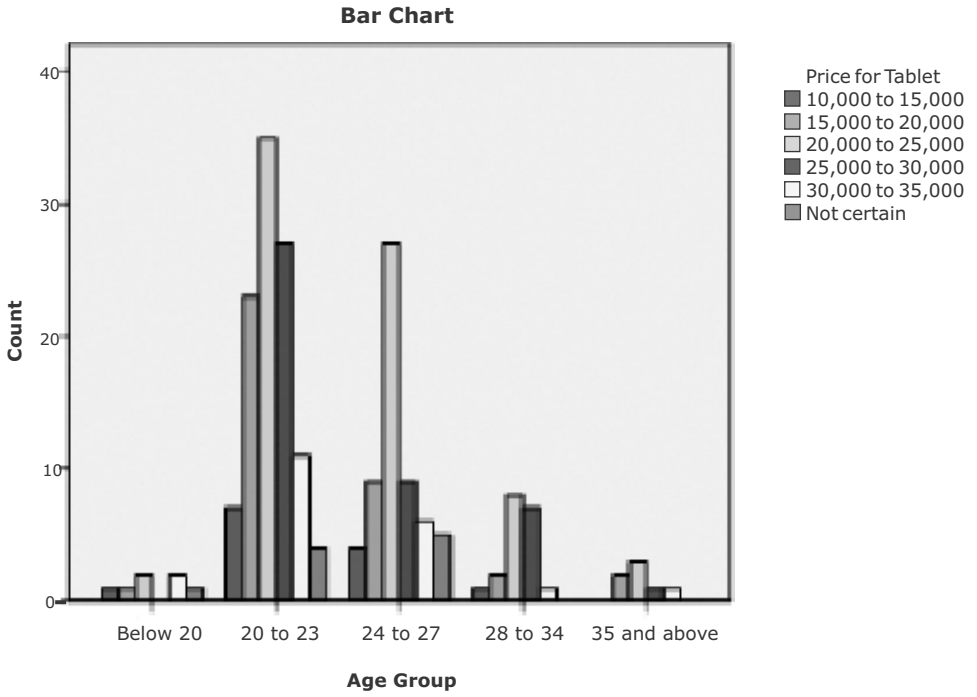

Figure 3: Age group Vs Price

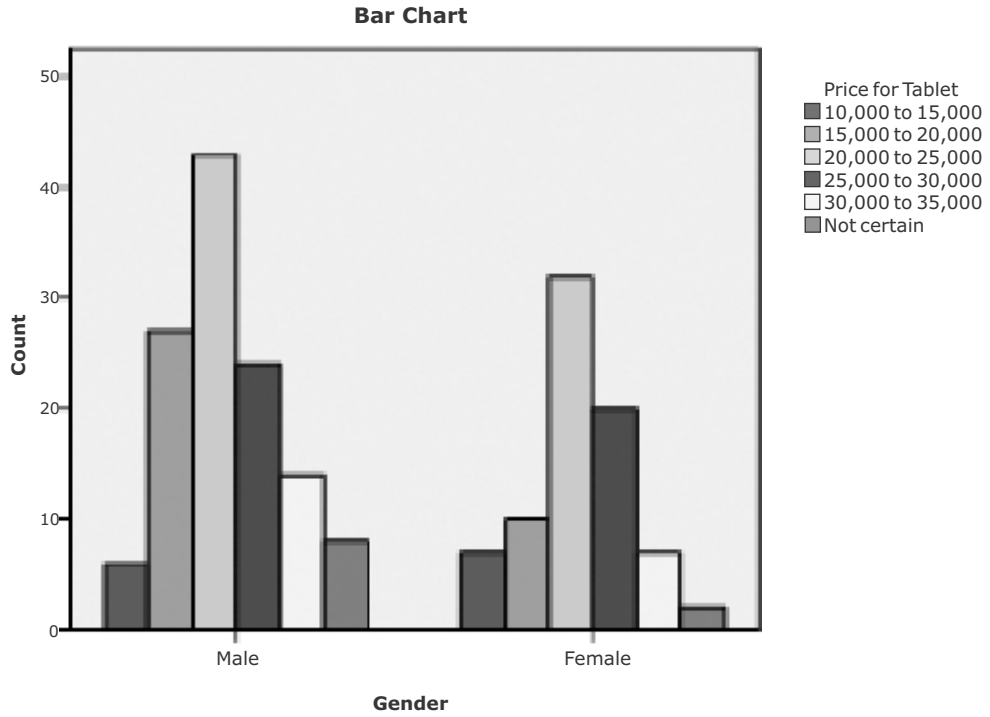

Figure 4: Gender Vs Price

After conducting the cross tabulations for different demographics and geographies we found that, except for family income remaining parameters exhibited similar pattern. All the parameters including the family income has selected the price range of 20,000/- to 25,000/- as best suitable range.

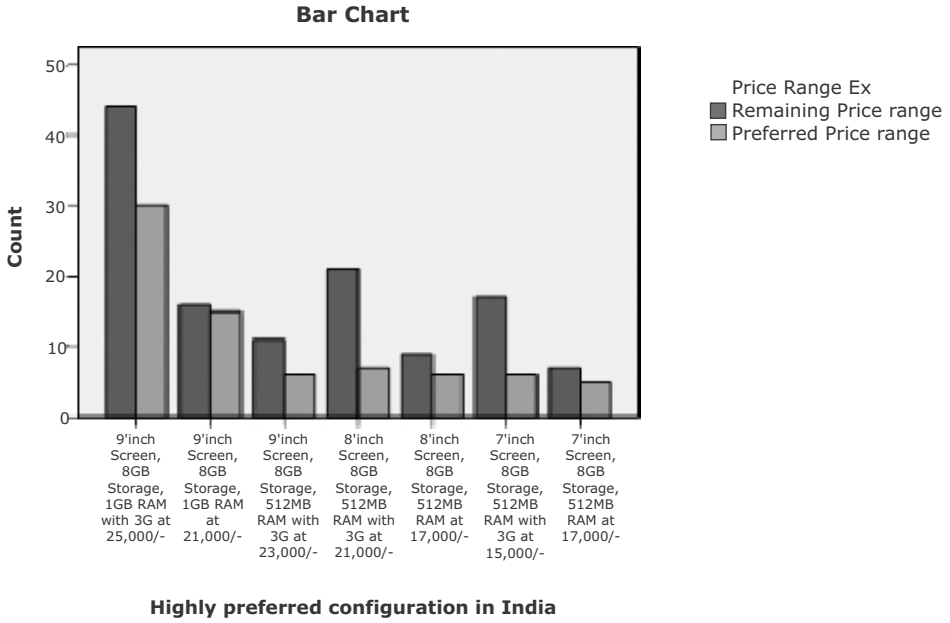

Figure 5: Preferred Price (20,000/- to 25,000/-) Vs Configuration

It is very clear from the above cross tabulation that, 9' inch Screen, 8GB Storage, 1 GB RAM, and 3G is the widely preferred configuration. While observing the other options it quiet evident that people are interested in the tablets with 3G facility to maximum extent.

Discriminant Analysis: (For Customer Requirements)

We have attempted Discriminant analysis in order to find out whether the population in urban and suburban areas are in need of same features in a tablets or not. For this test we have taken the variable Region as independent and the features required as dependent variables.

Table 1: Case Processing Summary for Discriminant Analysis

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
WI-FI	200	100.0%	0	.0%	200	100.0%
Weight	200	100.0%	0	.0%	200	100.0%
3G	200	100.0%	0	.0%	200	100.0%
Touch Screen	200	100.0%	0	.0%	200	100.0%
Support Keypad	200	100.0%	0	.0%	200	100.0%
Long Battery	200	100.0%	0	.0%	200	100.0%

From the above Table 1 it is very clear that number of samples considered is 200 in all the cases. The number of independent variables is 2, so the ratio of Samples and Variables is 100:1 (N: v) while the recommended ratio is more than 20:1. So we met the first requirement.

Table 2: Prior Probability analysis

Prior Probabilities for Groups

Prior	Cases Used in Analysis	
	Unweighted	Weighted
.500	100	100.000
.500	100	100.000
1.000	200	200.000

From the above Table 2 it is clear that each independent variable is having 100 as weight, the minimum requirement to satisfy the condition of minimum terms is, each field should have more than 2 cases for the analysis to be carried out, i.e. number of cases in each segment should be more than number of segments. So condition 2 is satisfied.

Table 3: Classification table for Discriminant analysis

Classification Results[b,c]

			Predicted Group Membership		
		Region	Urban	Suburban	Total
Original	Count	Urban	75	25	100
		Suburban	42	58	100
	%	Urban	75.0	25.0	100.0
		Suburban	42.0	58.0	100.0
Cross-validated[a]	Count	Urban	75	25	100
		Suburban	42	58	100
	%	Urban	75.0	25.0	100.0
		Suburban	42.0	58.0	100.0
a. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.					
b. 66.5% of original grouped cases correctly classified.					
c. 66.5% of cross-validated grouped cases correctly classified.					

From the table 6 prior to any transformations of variables to satisfy the assumptions of Discriminant analysis or removal of outliers, the cross-validated accuracy rate were 66.5%. This accuracy rate is the benchmark that we will use to evaluate the utility of transformations and the elimination of outliers.

Having satisfied the level of measurement and sample size requirements, we turn our attention to conformity with the assumption of normality, the detection of outliers, and the assumption of homogeneity of the covariance matrices used in classification. First, we will evaluate the assumption of normality for the first independent variable.

Table 4: Skewness and Kurtosis Values for required features

S.no	Required Features	Skewness	Kurtosis
1.	WI-FI	-0.581	-0.146
2.	Weight	-1.408	2.200
3.	3G	-0.944	0.301
4.	Touch	-0.733	0.357
5.	Key Pad	-0.821	0.64
6.	Battery Back up	-1.043	0.651

Theoretically the Skewness and Kurtosis values must be in the range of -1 to +1 to proceed further with the test. Except for Weight and Battery back up the remaining parameters are having the skewness and kurtosis in the range of -1 to +1. So the answers we got for the remaining parameters are true while for weight and battery are not true.

Mahalanobis distance test:

We have conducted Mahalanobis distance test to find out the outliers in this 2 cases and then eliminate them. We have taken probabilities for filtrations the minimum being 0.05 and the limit being 0.10, nothing but the 95% and 90% significance levels. We found no outliers in this test that are going to effect the values, all the Squared Mahalanobis distance to centroid practical values are less than the significant value of 5.99,so proceeding further.

Box Test:

H0: Equal dispersion is true
H1: Equal dispersion is not true

Table 5: Box test results with level of significance

Test Results

Box's M		2.471
F	Approx.	2.459
	df1	1
	df2	117612.000
	Sig.	.117

Tests null hypothesis of equal population covariance matrices.

From the above figure 5, we can infer that the obtained significant value is 0.117 which is more than the actual significance level of 0.05. Hence Null hypothesis is not rejected, so equal dispersion is there.

Multi collinearity:

Multi collinearity occurs when one independent variable is so strongly correlated with one or more other variables that its relationship to the dependent variable is likely to be misinterpreted. Its potential unique contribution to explaining the dependent variable is minimized by its strong relationship to other independent variables. Multi collinearity is indicated when the tolerance value for an independent variable is less than 0.10 when we take 90% significance level and 0.05 when we consider 95% significance level.

Table 6: Multi collinearity evidence for Discriminant analysis

Variables Not in the Analysis

Step		Tolerance	Min. Tolerance	Sig. of F to Enter	Min. D Squared	Between Groups
0	WI-FI	1.000	1.000	.651	.004	Urban and Suburban
	Weight	1.000	1.000	.000	.341	Urban and Suburban
	3G	1.000	1.000	.001	.220	Urban and Suburban
	Touch Screen	1.000	1.000	.000	.611	Urban and Suburban
	Support Keypad	1.000	1.000	.000	.296	Urban and Suburban
	Long Battery	1.000	1.000	.000	.288	Urban and Suburban

Step		Tolerance	Min. Tolerance	Sig. of F to Enter	Min. D Squared	Between Groups
1	WI-FI	.974	.974	.208	.648	Urban and Suburban
	Weight	.600	.600	.449	.624	Urban and Suburban
	3G	.710	.710	.709	.614	Urban and Suburban
	Support Keypad	.553	.553	.852	.612	Urban and Suburban
	Long Battery	.690	.690	.426	.626	Urban and Suburban

Form the above analysis we can say that all the parameters are having the tolerance value more than 0.05, so there is no problem of multi collinearity for this analysis.

Wilk's Lambda:

Wilk's Lambda is the ratio of within-groups sums of squares to the total sums of squares. This is the proportion of the total variance in the Discriminant scores not explained by differences among groups. A lambda of 1.00 occurs when observed group means are equal (all the variance is explained by factors other than difference between those means), while a small lambda occurs when within-groups variability is small compared to the total variability. A small lambda indicates that group means appear to differ. The associated significance value indicates whether the difference is significant.

Table 7: Wilk's Lambda score card with significance

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.866	28.337	1	.000

Ho: Group means appear to differ.
H1: Group means do not differ.

From the above table 7, we can see that the Wilk's Lambda value is 0.866, this indicates that 86.6% of variability is present within the groups. It is a high value suggesting high variance with in the groups compared to total variability. Significance value of the Wilk's Lambda test is less than the significance level of 0.05 so the test is not a failure and we cannot reject the Null hypothesis in favor of alternate hypothesis. We conclude that the group means differ.

Group Centroid

Table 8: Group centroid Values

Functions at Group Centroid

Region	Function
	1
Urban	.391
Suburban	-.391

Functions at Group Centroid indicate the average Discriminant score for subjects in the two groups. More specifically, the Discriminant score for each group when the variable means (rather than individual values for each subject) are entered into the Discriminant equation. Note that the two scores are equal in absolute value but have opposite signs.

Counter Checking

From Table 2 we can see that the probabilities of the 2 independent variables are 0.5 each. Calculating the practical percentage of cross valid groups, those are correctly classified.
$(0.5)^2 + (0.5)^2 = 0.5$this value is very close to the obtained value of 66.5% in Table 1

Conclusions

After conducting the cross tabulations for different demographics and geographies we observed that, except for family income remaining parameters exhibited similar pattern. All the parameters including the family income has selected the price range of 20,000/- to 25,000/- as best suitable range. The configuration selected widely by the respondents was 9' inch Screen, 8GB Storage, 1 GB RAM, 3G and operating system selected was windows 7 and android. While observing the other options it quiet evident that people are interested in the tablets with 3G facility to maximum extent.

From the Discriminant analysis, it is very clear that there is some distinction between the requirements of urban and suburban areas, but the research found out that the suburban people are willing to pay more prices for relatively lower configurations than the urban people.

Recommendations:

1. The Suburban market is good along with urban market, but the infrastructure like WIFI, 3G, GPS etc. are still in the novice stage, and it is not advisable to enter them right now.

2. The most preferred Price range was 20,000/- to 25,000/- and the expectations of the customer are also high, it is wise to design higher configurations.
3. The ideal segment to target can be Urban population between 20-35 years of age and gender with family income more than 3, 00,000/- preferably corporate and students .

Limitations of the study:

1. The study is restricted to some urban and suburban areas (Delhi, NCR, Hyderabad, Nagpur and Rajahmundry.
2. The project deals with general applications and we have not worked on specific applications by Apple or Android.

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