Underlying Dimensions of Purchase Decision Process for Consumer Durables: A Confirmation of the Customer - Value Hierarchy Model

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ABSTRACT

The purpose of this study was to find out the dimensions (factors) that customers use in deciding about purchasing a consumer durable, more specifically, a color television. A thirteen item questionnaire was used to elicit responses from 100 potential customers in the city of Jaipur. Factor analysis (data reduction technique) was applied on the collected data. It resulted in the emergence of five factors viz. Core Features; Reliability and Cost; Ease of Operation; Memory, Aesthetic, and Response features; Brand Performance and New features. This seems to confirm the customer - value hierarchy model of five product levels namely Core Benefit, Basic Product, Expected Product, Augmented Product, and Potential Product as these levels match with the earlier five factors presented in the research study. The implication of this study is the continued relevance of looking at a consumer durable as a five layered product offering.

Keywords : factor analysis, customer-value hierarchy, five product levels, consumer durables

The consumer durables market in India was estimated to be around US$ 4.5 billion in 2006-07. More than 7 million units of consumer durable appliances were sold in the year 2006-07, with colour televisions (CTV) forming the bulk of the sales with 30 per cent share of volumes (Indian Brand Equity Foundation Report). Both Indian and MNC companies are trying to leverage this opportunity by trying to understand the consumer purchase decision process. The product would need to be differentiated and customized to suit the unique demands of the market.
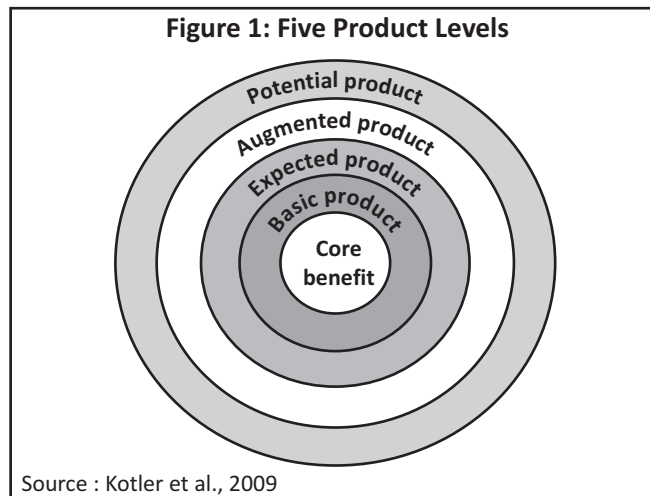
The Color TV industry in India has seen a gamut of changes in the past one decade as liberalization set in the Indian sub-continent, making its market highly competitive and consumer driven. Plasma display panels and LCD display TVs registered an average growth of more than 250% in 2006-07 (The Marketing Whitebook, 2010-11, p.164) and the trend is expected to continue. The Indian consumer is indifferent towards choosing a brand, since a lot of close substitutes are available in the market. In the process, the producers became price takers rather than price setters, and Color TVs became a necessity good. The Indian consumer has changed ever since India liberalized its economy. The Indian consumer not only wants variety in the products, but also demands high quality and service in those products. Among consumer durables, television is considered to be a pioneer lifestyle product that has set many trends. With the fast-changing liberalization policies, changing and growing demands of the consumers has made this industry highly competitive. The companies (domestic or international) strive for having a major share in the market in this sector of Liberalized India. In this research study, we have made an attempt to analyze the factors that influence the buying decision of the consumer in choosing a new colour TV by taking variables other than the role of the family or other social factors.

LITERATURE REVIEW

Products are always a combination of the tangible and the intangible attributes (Levitt, 1980). Levitt presented the total product concept comprising of four levels, i.e. : Generic product, Expected product, Augmented product, and Potential product. The first level, the Core Benefit, has been added to Levitt's discussion to make it five product levels (Refer to Figure 1). These five product levels constitute a customer-value hierarchy (Kotler et al., 2009). We wanted to investigate the continued relevance of looking at a consumer durable as a five layered product offering and its

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Figure 1: Five Product Levels

Potential product

Augmented product

Expected product

Basic product

Core benefit

Source : Kotler et al., 2009

implications for the marketers of consumer durables in general and T.V marketers in specific.

Seshaiah and Krishna (2003) studied the effect of liberalization on Color TV Industry in India. Ravichandran and Narayanarajan (2004) determined the factors for the brand preference of TVs with special reference to Thoothukudi district in Tamil Nadu. Lahiri and Samanta (2010) studied factors influencing purchase of apparels from organized retail outlets.

METHODOLOGY

As we were interested in determining the factors which customers keep in mind when they purchase a new colour television, we decided to conduct this study in Jaipur city, which is one of the fastest-growing cities in India. We divided Jaipur city into five different zones viz. East zone, West zone, North zone, South zone and Central zone, and used random sampling technique to select 20 respondents from each zone (customers who visited TV showrooms in these zones). Thus, a total sample of a hundred respondents was taken. We prepared a set of 13 statements reflecting various variables (attributes) of the product (colour TV) and designed a questionnaire containing this set of 13 variables. The respondents were requested to rank the statements on a 5-point Likert scale basis (1= Not at all important, 2= Not important, 3= Neutral, 4=Important, 5 = Very important). The responses given by the respondents were based on their perceptions about some attributes of the colour television. The preliminary draft of the questionnaire was pre- tested on 20 respondents. This helped in improving the questionnaire. We have used Factor Analysis, a data reduction technique for identifying underlying dimensions (factors) involved in the consumer decision process. We used SPSS 16 for analyzing the collected data.

RESULTS AND DISCUSSION
FACTOR ANALYSIS

❖ **KMO and Bartlett's Test :** Before applying Factor Analysis, it is customary to check the data adequacy for it. The value of the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was calculated (Refer to Table 1). It shows the suitability of the data for factor analysis and indicates the proportion of variance in the variables, which is common

| Table 1: KMO and Bartlett's Test (Source: Primary data)		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.645
Bartlett's Test of Sphericity	Approx. Chi-Square	302.292
	df	78
	Sig.	.000
Source : Primary Data		

variance. High values (close to 1.0) generally indicate that a factor analysis may be useful with the data. If the value is less then 0.50, the results of the factor analysis probably would not be very useful. For the present study, the overall measure of sample adequacy was found to be 0.645, which is also very large. It supports that the sample was good enough for factor analysis. The test value of Bartlett's test of sphericity (chi-square value = 302.292, degree of freedom = 78, significance at 0.000) provided a good support for the validity of the factor analysis of the data set. These tests confirm that the data is adequate for factor analysis. Thus, factor analysis may be considered an appropriate technique for analyzing the given data.

❖ **Communalities :** The Table 2 shows the communalities defined for each variable based on the extracted factors. Ideally, the communalities should be 1.00, and the minimum acceptable value is 0.5. Table 2 shows that all the extracted communalities were acceptable, and all variables were fit for the factor solutions as their extraction values are large.

Table 2: Communalities		
	Initial	Extraction
Price	1.000	.626
Display Size	1.000	.531
Sound Quality	1.000	.723
Picture Quality	1.000	.679
Response Time	1.000	.555
No. of Channels	1.000	.811
Stylish Look	1.000	.673
New Features	1.000	.674
Power Consumption	1.000	.687
Angle of View	1.000	.727
Durability	1.000	.745
Warranty	1.000	.705
Brand Performance	1.000	.659
Extraction Method: Principal Component Analysis. Source : Primary Data		

Table 3: 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	2.997	23.051	23.051	2.997	23.051	23.051	2.069	15.919	15.919
2	1.931	14.855	37.906	1.931	14.855	37.906	2.069	15.918	31.837
3	1.507	11.595	49.501	1.507	11.595	49.501	1.816	13.972	45.809
4	1.337	10.286	59.787	1.337	10.286	59.787	1.548	11.908	57.716
5	1.024	7.878	67.665	1.024	7.878	67.665	1.293	9.948	67.665
6	.888	6.832	74.496						
7	.698	5.368	79.864						
8	.608	4.674	84.538						
9	.561	4.314	88.852						
10	.429	3.302	92.153						
11	.407	3.130	95.283						
12	.365	2.810	98.093						
13	.248	1.907	100.000						
Extraction Method: Principal Component Analysis. Source : Primary Data									

Figure 2: Scree Plot

Scree Plot

Source : Primary Data
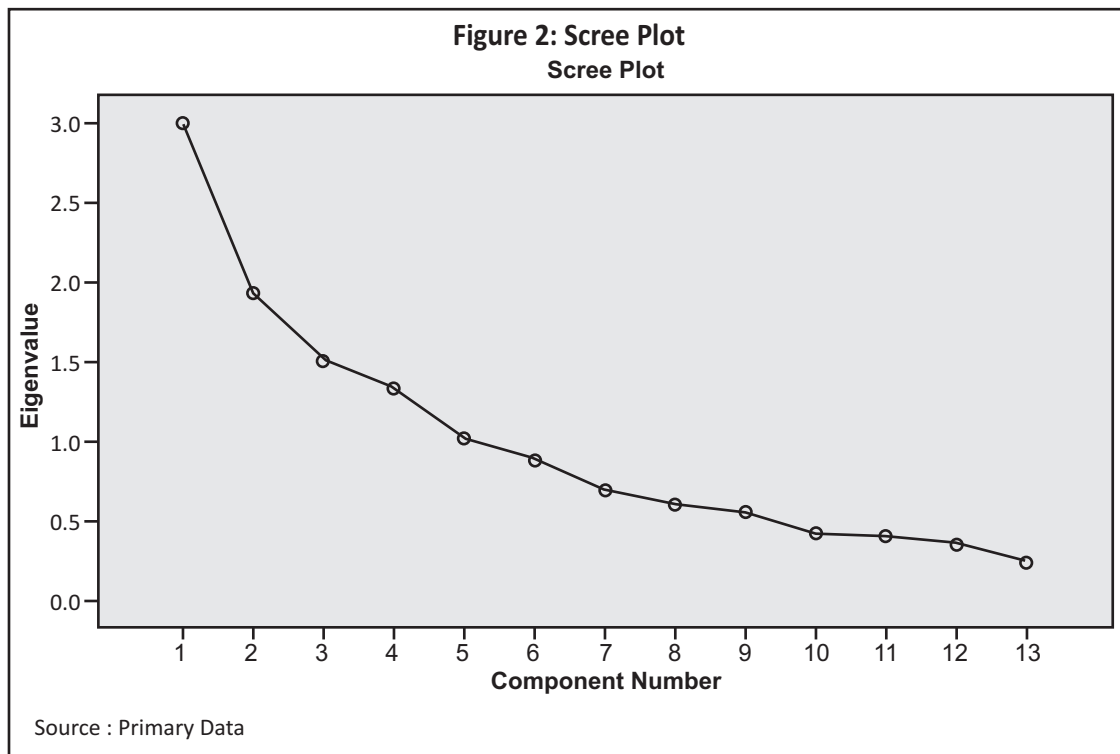
The Table 3 is one of the most important representations of factor analysis, as it defines the percent of variance defined by each component. Since only those components whose Eigen value is greater than 1.00 are considered, the first 5 components have been taken as factors. It is seen that using 5 factors, 67.665% of the variance of the variables can be defined, i.e. in simple terms, the first 5 components can explain 67.665% of the original data set.

The scree plot (Figure 2) is also a useful tool to decide about the number of factors. If one has drawn a parallel line to the horizontal at Eigen value equals to 1 in the scree plot, it will tell us how many factors are going to be extracted. In

Table 4: Component Matrix[a]					
	Component				
	1	**2**	**3**	**4**	**5**
Angle Of View	.681		.510		
Sound Quality	.616				
Response Time	.574				
Display Size	.550		-.425		
Warranty	.455	.699			
Durability	.538	.667			
Stylish Look	.503	-.525			
Power Consumption			.766		
Picture Quality	.542		-.612		
No. of Channels				.644	.465
New Features				.629	
Brand Performance	.496			-.533	
Price		.492			.593
Extraction Method: Principal Component Analysis. [a] Five components Extracted					
Source : Primary Data					

Table 5: Rotated Component Matrix[a]					
	Component				
	1	**2**	**3**	**4**	**5**
Sound Quality	.791				
Display Size	.695				
Picture Quality	.670				
Durability		.816			
Warranty		.783			
Price		.561			
Power Consumption			.803		
Angle of View			.741		
No. of Channels				.893	
Stylish Look			.438	.571	
Response Time				.469	.404
Brand Performance					.706
New Features		.434			-.628
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.([a]- Rotation converged in 12 iterations)					
Source : Primary Data					

our analysis, the scree plot shows that five factors were to be extracted.

Factor loadings are used to measure the correlation between variables and the factors. A loading close to one indicates a strong correlation between a variable and the factor, while a loading closer to zero indicates a weak correlation. Unrotated solution of factor loading is not suitable for interpretation purpose since the variables tend to generally load on multiple factors (Table 4). The factors are rotated using varimax with Kaiser Normalization rotation method (Table 5). We have used Principal Component Analysis (PCA) method for factor extraction. We have used only those variables which have loadings near to 0.5 or greater than 0.5 for the interpretation purpose.

NAMING AND INTERPRETING THE FACTORS
❖ **FACTOR 1: (Core Features of TV)**
❖ Sound Quality (0.791)
❖ Display Size (0.695)
❖ Picture Quality (0.670)

This is the most important factor and explains 15.919 % of the variations. This factor defines the variables like "Sound quality" (0.791), "Display size" (0.695) and "Picture quality" (0.670). Hence, it is named as "Core features of the TV Brand". This variable suggests that there are some basic core features which a customer looks for while going for the purchase of a colour TV. These core features provide core benefits and can be visualized as the first inner layer of the customer - value hierarchy model of five product levels (Refer to Figure 1).

❖ **FACTOR 2: (Reliability and Cost)**
❖ Durability (0.816)
❖ Warranty (0.783)
❖ Price (0.561)

The above-mentioned three variables have been loaded on this factor. This factor is the second significant factor which accounts for 15.918% of the variations. This factor defines the variables like "Durability" (0.816), "Warranty" (0.783), and "Price" (0.561). All of these three attributes are closely related as the quality aspect of durability and warranty conveys reliability and always comes at a price. This is the basic requirement of a consumer durable as it has

to last repeated usage and hence, can be considered as a basic product, the second product layer of customer - value hierarchy model of five product levels (as shown in the Figure 1).

❖ **FACTOR 3: (Ease of Operation)**
❖ Power Consumption (0.803)
❖ Angle of View (0.741)

This factor explains 13.972% of the variation and comprises of two variables about the "Power Consumption" and "Angle of View". The factor loadings are 0.803 and 0.741. Hence, the factor is named as "Ease of Operation". The factor suggests that a TV should consume less power (so that the electricity bill of a customer is lower) and quality of watching from whatever vantage point should be good. This is expected of a consumer durable and hence can be considered as an "Expected product", the third product layer of the customer - value hierarchy model of five product levels (Refer to Figure 1).

❖ **FACTOR 4: (Memory, Aesthetic, and Response)**
❖ No. of channels (0.893)
❖ Stylish look (0.571)
❖ Response time (0.469)

The fourth factor elucidates the significance of people's attitude towards the "Memory or No. of channels" (0.893), "Aesthetic or Stylish look" (0.571), and the "Quick response time" (0.469) of the TV. Hence, this factor can be called "Memory, Aesthetic, and Response factor" and it explains 11.908% variation. Whether this can be considered expected or the augmented product layer is open to interpretation as an augmented product level can, with the passage of time, and due to catching up by the competitors regress to an expected product level. But at the time of conducting the study, it was considered as the augmented product level - the fourth layer of the customer-value hierarchy model of five product levels (Refer to Figure 1).

❖ **FACTOR 5: (Brand Performance and New features)**
❖ Brand Performance (0.706)
❖ New Features(-0.628)

The "Brand Performance and New Features" factor takes into consideration 9.948% of the variations. The factor loading 0.706 of the variable "Brand Performance" indicates that customers give importance to the past performance

Table 6: Naming of the Factors			
Factor No.	Name of factor	Variables	Factor Loadings
F₁	Core features of TV	Sound quality	0.791
		Display size	0.695
		Picture quality	0.670
F₂	Reliability and Cost	Durability	0.816
		Warranty	0.783
		Price	0.561
F₃	Ease of Operation	Power consumption	0.803
		Angle of view	0.741
F₄	Memory, Aesthetic, and Response	No. of channels	0.893
		Stylish look	0.571
		Response time	0.469
F₅	Brand Performance and New features	Brand performance	0.706
		New features	-0.628
Source : Primary Data			

Figure 3: Sequence of the importance of the factors in Descending Order

Source : Primary Data
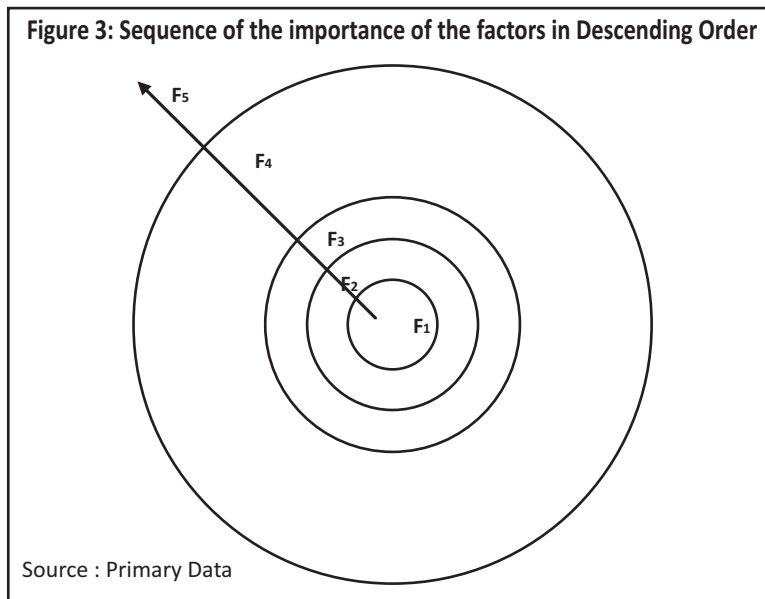
of TV and loading of -0.628 of the variable "New Features" indicates that customers are also interested if new extra features are added to the brand of TV. As there is no limit to the equity that a brand can command in the minds of the customers, as well as the innovations that can happen in the domain of additional features are also unlimited, hence, this dimension could be conceived as the "Potential product" , the fifth layer of the customer - value hierarchy model of five product levels (Refer to Figure 1). These five factors (Table 6) suggest that when customers go in for the purchase of a new color TV, they give importance to these factors in this sequence i.e., first they look for the "Core features of a TV", secondly, they look for the "Reliability and Cost factor" ; third, they look for the "Ease of Operation", fourth, they look for "Memory, Aesthetic, and Response" factor and finally, the "Brand Performance and New features factor". The Figure 3 shows the sequence of these factors in the decreasing order of importance given by the customers.

CONCLUSION

This study shows five important factors considered by customers when they go in for the purchase of a new colour television. For TV manufacturers, these five factors are strong hints to look at the design of their products carefully. They can redesign their products according to these factors, and consequently, customers will get a better product. The emergence of these five factors viz. Core Features; Reliability and Cost; Ease of Operation; Memory, Aesthetic, and Response features; Brand Performance and New features seem to confirm the customer - value hierarchy model of five product levels namely - Core Benefit, Basic Product, Expected Product, Augmented Product and Potential Product respectively. The implication of this study is the continued relevance of looking at a consumer durable as a five layered product offering. The limitation of the study is the use of an instance of colour T.V. as a representative of a typical consumer durable which may or may not be justified. Hence, this study may be considered more of an exploratory research than a conclusive research study. This gives a considerable scope for its future replication in other consumer durables across time and space contexts.

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