

# The effect of Packaging Design on Product Quality, Value, and Brand Preference - Empirical Findings

Govind K.V.<sup>(1)</sup>, Alen Mathew<sup>(2)</sup>, Bibin K.J.<sup>(3)</sup>, Yadhukrishnan D.<sup>(5)</sup> - B Tech Students  
Department of Mechanical Engineering  
TOMS College of Engineering, Mattakkara  
Kottayam, Kerala, India

Akilraj. A.S. - Assistant Professor  
Department of Mechanical Engineering  
TOMS College of Engineering, Mattakkara  
Kottayam, Kerala, India

Dr. Biju Augustine - Professor  
Department of Mechanical Engineering  
TOMS College of Engineering, Mattakkara  
Kottayam, Kerala, India

**Abstract** — Product packaging factors takes a dominant role in deciding the marketing strategy. Resent research findings highlight the linkage of the factors of packaging design such as visual dimensions, ease of use, environment friendly packing, protection of inside material, safety and durability of product etc. with the quality, value and brand preference of the product. This paper discusses the results of data analysis. The online product buyers are surveyed with a structed questionnaire and the data collected is analyzed according to pre specified objectives and methodology.

Well - designed packages reflect that merit into product quality also (customers believe so). Moderate link between packaging design and product value is a challenge to the suppliers to inculcate more value addition system. Strong link between packaging design and brand preference is a highlight of good branding strategy by the manufacturers. That strategy has to be continued. Very poor linkage between value and quality of the product raise some questions for detailed investigation. Larger sample size and clear and specific questionnaire tools are recommended for a thorough analysis.

**Keywords** – *Packaging Design, Quality, Value, Brand Preference, Ease of Use.*

## 1. INTRODUCTION

### A. BACKGROUND

Marketing companies and producers adopt different practices of marketing and sales promotion to attract customers for purchasing their product among various brands. Companies may choose various combinations of offers, such as good quality, attractive price, high value and good services. Adopting high quality and attractive packaging are two important types among these practices [1]. Successful buying happens from effective product display. Thus attractive / good packaging has got a significant role in product display [2]. To gain competitive advantage in markets, producers and sellers take advantage of packaging design. This includes graphics, color and appropriate packaging styles. Studying the linkages

between packaging design factors and product quality, value and brand preference become an important area of strategic marketing for sustained relationship between buyer and seller. Ample conclusions to improve the marketing is the expected turning point.

### B. PURPOSE OF THIS STUDY AND OBJECTIVES

This study aims to survey the effect of online purchased product's packaging design factors on customer's perceived quality, value and brand preference. A framework is developed to investigate the importance of the selected factors on quality, value and brand preference. Packaging design factors are identified from contemporary research literature. Analysis of the online survey data collected and the interpretations may be beneficial to develop effective strategic measures for improving the present way of marketing the products.

The objectives are stated below:

1. Investigate the effect of online purchased product's packaging design on customer's perceived quality, value and brand preference.
2. Investigate the importance of factors such as quality, value and brand preference on the packaging design.

## 2. LITERATURE REVIEW

Satisfied customers are the strength of a firm for a binding supplier – buyer relationship. Branding and packaging are effective measures for promoting the product. Quality of the product and value of the product are inevitable terms for effective customer relationship management. Branding and packaging decisions are closely related, as brands provide an umbrella of quality and reliability offered by the manufacturers to the customers for trusted purchases. A most important factor in marketing is visual packaging design. It may be the display, cover, container, arrangement of products inside or protective shield. This display and array conserve its quality during production, handling, transit, stalking, storage and distribution to final customer [4]

Research has shown that the attitude of the customer towards the packaging design influences their purchase behavior significantly [3]. This knowledge is the driving force of adopting packaging varieties as a strategic measure. Quality of a product is another thing. Quality is a degree to which product characteristics fulfils the demand [5]. Even though they are two different aspects, integrating both concepts will result in a synergic measure. It is observed that good products seek poor customer attraction due to bad packaging and products of inferior quality succeed due to better packaging design. The conflicting relationship between quality and value makes the idea more complex. Perceived value is the ratio between quality and price. Different customers interpret their perceived value in different manner [6].

Brand preference means the relative priority for a specific product (belongs to a particular brand) over other brands [7]. The selection leads to a purchase, after some mental exercise. Perceived Value is customer's perception of the better position of a service / product quality in than the competitor [8]. Perceived quality is a part of brand equity. The higher the perceived quality, the higher will be the brand equity [9]. Consumer's perceived quality cause loyalty to a brand, which increase consumer's purchase intention [10]. Mahajan and Vidhani [11] reports that perceived quality influence perceived value, customer satisfaction and purchase intention [12].

### 3. HYPOTHESES DEVELOPED FOR THIS STUDY

#### A) Linking the Packaging Design with Perceived Quality

Packaging design include visual dimensions such as color, letter size, pictures, expiry dates, directions, safety instructions, ease of unpacking, disposal of packing material etc. Packaging qualities include attractive, informative, safe and convenient features. People normally think well packed products will have good quality. It is hypothesized below:

**H1:** Positive attitude towards the packaging design of online marketed products has a significant effect on the customer's perception of its quality.

#### B) Packaging Factors and Brand Preference

Brand determines the identity of a company and distinguishes it from its other competitors. Brand is judged by customer's senses, emotions and perceptions [13]. Studies by Veloutsou and Bullester (2019) indicates that the products distributed in packets of different colors and packaging design invited customer's focus in differently [14]. Pramod *et al.* [15] observe that under the situations of not familiarity with a brand, the packaging design influenced the customers in a significant manner. It is hypothesized that:

**H2:** Positive attitude towards the packaging design of online marketed products has a significant effect on customer's brand preference.

#### C) Perceived Value and Packaging Design

Perceived Value is the customer's assessment of costs and benefits of enjoying a product or service. Perceived value is positively linked to customer's satisfaction. Perceived value and perceived quality are closely related. Research studies

reported that perceived quality influence perceived value. It is hypothesized that:

**H3:** Positive attitude towards the packaging design of online marketed products has a significant effect on customer's perceived value.

#### D) Linkage between Perceived quality, value and brand preference

Perceived Value is customer's perception of the better position of a service / product quality in than the competitor. Perceived quality is a part of brand equity. Products with high perceived quality will be selected by the consumers than the others. The higher the perceived quality, the higher will be the brand equity.

To test the influences of quality on perceived value, and perceived value on brand preference, following hypotheses are formulated:

**H4:** Customer's perception of the quality of online marketed products has a significant effect on their perceived value.

**H5:** Customer's perception of online marketed products value has a significant effect on their brand preference

### 4. QUESTIONNAIRE, SAMPLING, DATA COLLECTION AND ANALYSIS PLAN

Online buyers of products are surveyed with questionnaire supplied as google form. Random sampling is followed. Items (total 25 indicators) are phrased on a Five - point Likert Scale. Scores range from 1 to 5. Data collected online. Out of 150 inquiries, 113 complete responses are received. Questionnaire included two parts. Part A collected details of Gender, Age, Education and Occupation status of the respondent, suitably divided into categories. Preliminary descriptives, validity and reliability tests, T-tests and ANOVA and testing of hypotheses using Structural Equation Modeling are uses to analyze the data and to interpret the results.

### 5. FRAMEWORK DEVELOPED

#### A) Measurement Model and Structural Model

To test the hypotheses, statistical data collected from the respondents by Google forms and enumerated assisted questionnaire survey. A measurement model and structural model are developed as per structural equation modelling. Fulfilment of statistical requirements are evaluated. Regression line paths of the structural model form the respective hypotheses to be tested. The measurement and structural models are illustrated below:

Table 1: Hypotheses proposed

Hypotheses	Description
H1	Packaging design influence quality
H2	Packaging design influence value
H3	Packaging design influence brand preference
H4	Product quality influence value
H5	Value and brand preference are associated

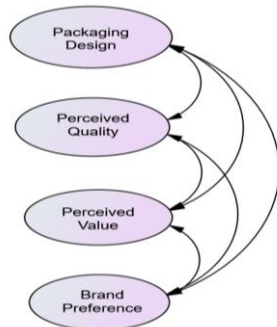


Figure 1: Measurement Model

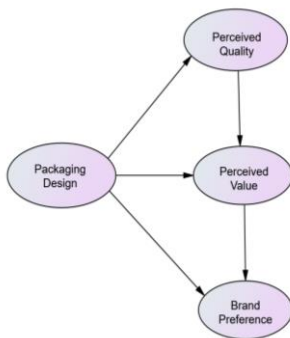


Figure 2: Structural Model

## B. SELECTION OF THE INDICATORS

There are four constructs used in this study. They are:

- Packaging Design
- Product Quality
- Value
- Brand Preference

### 1) Visual Design Factors

This construct is measured with 8 questions as indicators:

Table 2: Factors of Visual Design

Sl. No	Question
1	I prefer colorful packages
2	Should follow a color scheme by product related color
3	Product packages should have an attractive shape
4	The shape of the package should be unique
5	The lettering of packets should be large and clear to read
6	The price should be visible and easily distinguishable
7	Expiry date and list of ingredients must be clearly visible
8	Clear and good pictures on the packets to get idea of product

### 2) Other aspects of Packaging Design

They are is measured with the following 5 indicator items:

Table 3: Other aspects of packaging design

Sl. No	Question
1	Packages should be easily openable
2	Packaging material should be environment friendly
3	Packaging shall protect inside product from leak and damage
4	Size is adequate to retain shape and position of product
5	Price of the packaging should not be high

### 3) Product Quality

Product Quality is measured by asking the following questions:

Table 4: Product Quality

No.	Question
1	Products purchased online are found with good quality
2	Products distributed online use good colour scheme for packets
3	Products use well informed lettering, price display and pictures
4	Packaging size, shape and flexibility to retain the product inside

### 4) Perceived Value

Following questions are asked to infer perceived value:

Table 5: Perceived Value

No.	Question
1	Good visual display attributes to good quality and add value
2	Quality of the packaging add value to the customer
3	Convenience in handling the packaging add value to the user
4	Economy of packaging add value to the product user

### 5) Perceived Brand Preference

Table 6: Perceived Brand Preference

No.	Question
1	Branded products use good quality packaging design than non-branded products
2	User friendly packaging better followed in branded products
3	Eco - friendly packaging better followed in branded products
4	Better visual display of packaging is used in branded products

## 4. RESULTS

### A. DEMOGRAPHIC DATA

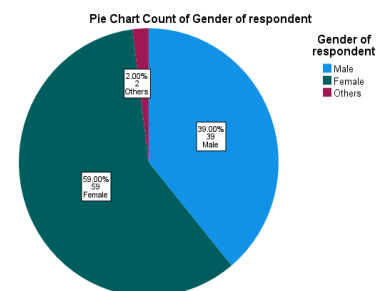


Figure 3: Gender Statistics

Out of the 100 respondents, 39 are males and 59 are females.

Respondents are classified into four groups of age. One respondent belongs to age less than 18, 58 persons belong to age between 18 and 28, 33 numbers in between 26 to 45 years of age and 8 persons are of age above 45.

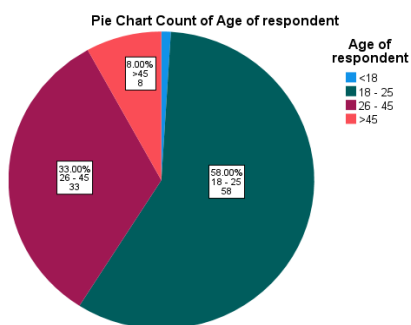


Figure 4: Age of the Respondent

Respondents are classified into four groups according to occupation of respondent (Student- 51, Employees – 4, House wives – 18 numbers and businessmen – 27). Education of respondent is classified into three groups (under graduate 40, Graduate 34 and professional 100).

**B. Normality and Validity of Data**

Normality is an important condition for statistical analysis. Normality is tested graphically by plotting the Histogram with normal distribution curve. Kolmogorov – Smirnov test is used to confirm normality.

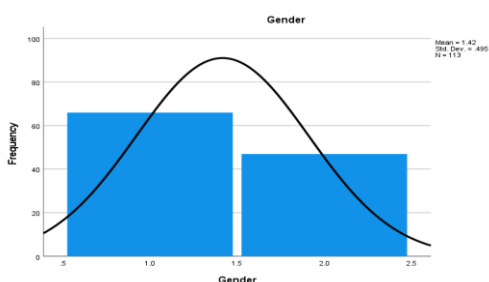


Figure 5: Gender of Respondent

Result of Kolmogorov – Smirnov test is illustrated in Table 6. Similar results are obtained for occupation, education and age of the respondent.

Table 7 Normality Test Results

One Sample Kolmogorov – Smirnov Test of Normality					
		Gender	Age	Occupation	Education
N		100	113	113	112
Normal Parameters	Mean	1.63	2.48	2.12	1.86
	Std. Deviation	.525	.659	1.225	.804
Most Extreme Differences	Absolute	.369	.357	.330	.258
	Positive	.275	.357	.330	.258
	Negative	-.369	-.223	-.214	-.182
Test Statistic		.369	.357	.330	.258
Asymp. Sig. (2-tailed) <sup>a</sup>		.000	.000	.000	.000

a. Test distribution is Normal.

Content Validity means the agreement of the proposed concept with established research or theory. It is established from literature review. Construct validity or Reliability of the items is established from the calculated values of Cronbach's Alpha Reliability values are listed in Table 7.

Table 8: Reliability values of visual display

	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
VD1	.352	.330	.727
VD2	.473	.299	.702
VD3	.470	.469	.703
VD4	.507	.443	.695
VD5	.444	.366	.710
VD6	.390	.430	.719
VD7	.414	.440	.715
VD8	.423	.432	.713

**B. Use of Exploratory Factor Analysis (EFA) to reduce the number of items to few numbers**

Exploratory Factor Analysis is used to reduce a large number of indicator items to few meaningful constructs. Also EFA is used to confirm the indicator items of a construct are truly representing the same construct. In this study, all indicators are tested with EFA. Some indicators are excluded from the study for not conforming the statistical requirement. EFA procedure of only one construct (Visual Display) is explained here.

There are 8 indicators of visual display, coded from VD1 to VD8. EFA calculates communality of the indicator items. Those with communality less than 0.5 are excluded from the analysis. K -M-O Criterion and Bartlett's test for sample adequacy are two necessary conditions to be fulfilled by the indicators. All indicators are found with enough sample adequacy and communality.

Table 9: Sample Adequacy Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.746
Bartlett's Test of Sphericity	Approx. Chi-Square	235.561
	df	28
	Sig.	.000

Table 10: Communalities

Communalities		
	Initial	Extraction
VD1	1.000	.588
VD2	1.000	.504

VD3	1.000	.687
VD4	1.000	.648
VD5	1.000	.582
VD6	1.000	.650
VD7	1.000	.670
VD8	1.000	.615
Extraction Method: Principal Component Analysis.		

Factor reduction resulted into two clear factor constructs, as indicated in the rotated factor component matrix shown below:

Table 11: Factor Loadings

Rotated Component Matrix		
	Component	
	1	2
VD1	-.078	.763
VD2	.206	.679
VD3	.030	.828
VD4	.116	.796
VD5	.753	.122
VD6	.806	.031
VD7	.818	.023
VD8	.780	.082
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.		

Indicator – items VD1, VD2, VD3 and VD4 are loaded into a single construct with high loadings. This construct is termed as VIS1 – Color and lettering. Items VD5, VD6, VD7 and VD8 are loaded into a second construct named VIS2 – Shape of packing. About 61 percent variability is explained by these two constructs. EFA is conducted in the similar manner for the remaining indicators of Quality, Value and Brand preference. All indicators are reduced to individual single constructs.

### C. Testing the Hypotheses using T-Test and ANOVA

Variability within the control groups, namely Gender, Age, Education and Occupation of the respondent are tested with One sample T-tests and One way ANOVA. Overall satisfaction is selected as the dependent variable. Hypotheses test results are summarized in the following table:

Table 12: Summary of the Hypotheses Tests

Hypothesis	Statement	Significance	Conclusion
H <sub>1a</sub>	No difference in the use of product packaging by male and females	> 0.05	The control variables, namely Age, Gender, Education and Occupation of the respondent did not influence the Packaging design, Quality, Value and Brand Preference.
H <sub>1b</sub>	No difference in the use of product packaging by different age groups	> 0.05	
H <sub>1c</sub>	No difference in the use of product packaging by occupational level	> 0.05	
H <sub>1d</sub>	No difference in the use of product packaging by educational levels	> 0.05	

H <sub>2a</sub>	No difference in perceptions of product quality by male and females.	> 0.05	occupation of the respondent did not influence the Packaging design, Quality, Value and Brand Preference.
H <sub>2b</sub>	No difference in the perceptions of product quality by age groups	< 0.05	
H <sub>2c</sub>	No difference in product quality by education levels	> 0.05	
H <sub>2d</sub>	No difference in the perceptions of quality by occupational levels	> 0.05	
H <sub>3a</sub>	No difference in the perceptions of value by male and females	> 0.05	
H <sub>3b</sub>	No difference in the perceptions of value by different age groups	> 0.05	
H <sub>3c</sub>	No difference in the perceptions of value by education levels	> 0.05	
H <sub>3d</sub>	No difference in the perceptions of value by occupational levels	> 0.05	
H <sub>4a</sub>	No difference in the brand preference by men and women	> 0.05	
H <sub>4b</sub>	No difference in the brand preference by different age groups	> 0.05	
H <sub>4c</sub>	No difference in the perceptions of brand preference by education levels	> 0.05	
H <sub>4d</sub>	No difference in the brand preference by different occupational levels.	> 0.05	

One way ANOVA has been conducted for the control variables Education, Age and Occupation of the respondent. No significant differences between groups is observed. We conclude that Education, Age and Occupation of the respondent do not have any significant influence on the use of packaging factors.

### E. Application of Structural Equation Modelling

Structural Equation Modelling and Confirmatory Factor Analysis is used to test the pre-conceived theory. A measurement model and structural model is used for testing and conformation of the proposed theory. There are four independent variables, namely Quality, Value and Brand Preference. It is proposed that a good and effective packaging design will have strong influence on the product quality, value and brand preference. Measurement model and structural models are tested with the data collected, and the results are interpreted with path analysis.

#### Measurement Model

All the constructs are allowed to co-vary freely in the measurement model. The parameters such as NFI, CFI, TLI, GFI (Different types of model fit indices) and statistical validity parameters such as RMR and RMSEA are tested. Overall model fit is assessed with a Chi-square test, for which the significance level below 0.05 is considered as acceptable.

There is strong correlation between Packaging Design, Quality, Value and Brand Preference. All correlations are good. The model fit is established by the Chi-square value of 169.11, with degree of freedom 84, significant at 99 percent confidence level. RMSEA and GFI values are 0.105 and 0.838 respectively. Fit indices, NFI, CFI and TLI are 0.792, 0.880 and 0.898 respectively. Results are lower than the standard figures, but the is reasonable with low sample size (N = 100). The measurement model is accepted and thus proceeded to the confirmatory factor analysis.

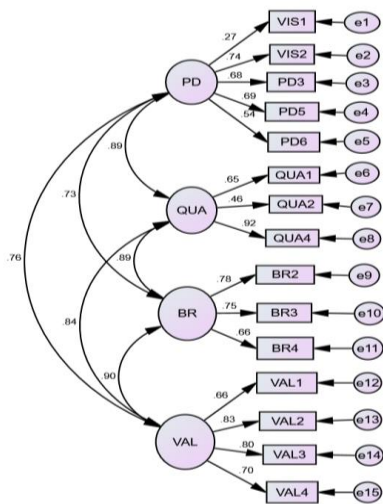


Figure 6: Measurement Model

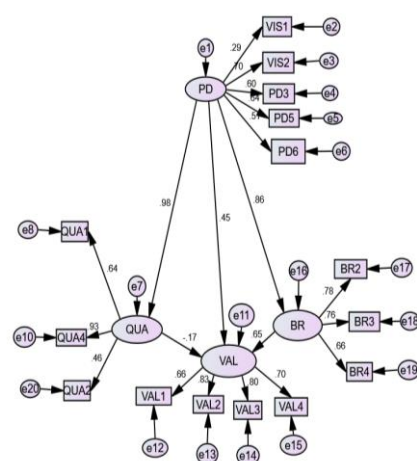


Figure 7: Structural Model

### Structural Model

Paths coefficients of the structural model explain the acceptance or rejection of the hypotheses stated. Strong loading (coefficient above 0.7) show that the the relationship is strong. Path coefficients give useful inputs for managerial decision making. Following hypotheses are tested:

Table 13: Hypotheses Test Results

Hypotheses	Description	Value	Inference
H1	Packaging design influence quality	0.98***	Strong influence
H2	Packaging design influence value	0.45***	Moderate influence
H3	Packaging design influence brand preference	0.86***	Strong influence
H4	Product quality influence value	0.17***	Weak influence
H5	Value and brand preference are associated	0.65***	Strong influence

A valid Chi-square of 178.73, with 85 degrees of freedom significant at 99.9 percent level confirms model fit. RMSEA value is 0.147. CFI, GFI, NFI and TLI values are between 0.78 and 0.90. RMSEA value of 0.106. Deviation with acceptable values are attributed to the small sample size. Better results with refines values of the fit indices can be expected for a large sample size.

From these results, it is clear that the packaging design contributes to the quality of the items. It is not a string attribute for the improved value to the customer, still the association is moderate. Strong linkage between packaging design and brand preference indicates that the branded companies are already been taken this as an effective strategy for improving the overall product quality. But the linkage between product quality and value is weak. This mean all items of good quality may not give value to the customer. The linkage between value and brand preference is sufficiently good.

### 5. CONCLUSIONS

The influence of packaging design on product quality can be considered by the manufacturers for choosing the product packaging strategy. Well packed / designed packages reflect that merit into product quality also (customers believe so). Moderate link between packaging design and product value has to be considered as a challenge by the manufacturers to inculcate more enriched value addition system.

Strong link between packaging design and brand preference is a highlight of good branding strategy by the manufacturers. That strategy has to be continued. Very poor linkage between value of the product and quality of the product is an area for more detailed investigation. More larger sample size and clear and specific questionnaire tools are recommended for a thorough analysis.

This study used a very small sample size of 100. The results of the structural equation models are affected due to lower sample size. Cross case validations are not performed due to lower sample size. For an accurate and distinct result, a sample size of 300 to 400, with two or three clusters of customers is recommended.

Future Scope: The result has to be checked with a larger sample size for different products such as food items, consumption goods, electronic items etc. Cross case comparisons of the results with control variables such as e-literacy, purchase power, occupation etc.

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