4. RESEARCH METHODOLOGY

The research design is divided into two parts, the first part is exploratory in nature and the second part is descriptive. In the exploratory part visual merchandisers and marketing managers of lifestyle retail outlet were interviewed to understand the dimensions of visual merchandising. The critical aspects of visual merchandising that could impact consumer behavior were explored. The study intended to focus on the impact of visual merchandising on the retail formats for three different product categories namely apparels, furniture and electronics. The study intended to generate tentative critical factors of visual merchandising which generate positive consumer behavior. The impact of the critical factors has been studied in the second part of the study which is descriptive in nature. As a part of the descriptive research leading retail outlets of Ahmedabad belonging to the above mentioned product categories were identified for the survey. A close ended questionnaire was used as sampling tool for survey. The sampling techniques used is random as customers who have purchased from the retail outlet were interviewed as they move out of the store post to their purchase along with the ones who have not purchased (Henry, 1990, MacNealy, 1999). The first 55 customers who walked out the retail outlet were surveyed for 7 days in order to generate the required sample size.

The following method was used for determining sample size from proportion to estimate exact sample size.

\[
S = \frac{Z^2 P (1-P)}{d^2}
\]

Following are the values for the equation

Z= Z VALUE (1.96)
P = Proportion value (0.5)
d= Precision Level (0.05)

Hence the sample size for the research would be 385 (Singh & Masuku, 2013, Cochran, 1963).
The reasons for using this formula is there is no information regarding the proportion of customers who are influenced by the visual merchandising and so the proportion of customers who are influenced vis a vis those not influenced as 50 : 50.

The sample size for survey in the three retail formats namely for furniture, interior and apparel included 385 each, taking the total sample size to 1155. For apparel stores that were studied are Ahmedabad Central, Pantaloons, Westside, Shoppers Stop and Brand Factory. Furniture stores included in study are @ Home, Home Town, Housefull, Godrej Interio and Durian. Electronics stores included in study are NEXT, Reliance Digital, Croma, Vijay Sales and Sales India.

4.1 Research Hypotheses

Research on circumstantial influences can be characterized by studying the relationship among various shopper essentials and the features of retailing. Shopper essentials might include involvement (Smith & Carsky, 1996), attitude (Reid & Brown, 1996) and ethnicity (Crispel, 1997), while retailing features includes store size (Owen, 1995), retail format (Fernie, 1996; Fernie & Fernie, 1997) and store personality (Abrams, 1996; Burns, 1992). In this study, shoppers purchase behavior as shopper essentials and visual merchandising as a feature for studying retail as an external cue are fixed as variables. Therefore, hypotheses were developed to study relationship between shoppers purchase behavior and various dimensions of visual merchandising in terms of apparel, furniture and electronics as product categories.

4.1.1 Research Hypothesis for Apparel Category

H1: Customers who purchase on impulse are influenced by window displays.

H2: Customers who purchase on impulse are influenced by in-store form/Mannequin display.

H3: Customers who purchase on impulse are influenced by floor merchandising.

H4: Customers who purchase on impulse are influenced by promotional signage.

Hypothesis 1 was formed to understand the relationship between window display and consumer behavior towards purchase. Hypothesis 2 was formed to understand the significant relationship between in-store form/Mannequin display and buying behavior. Hypothesis 3 was formed to understand the significant relationship between floor merchandising and buying behavior.
Hypothesis 4 was formed to understand the significant relationship between promotional signage and buying behavior.

### 4.1.2 Research Hypothesis for Furniture Category

**H5:** Customer’s purchases are influenced by window displays.

**H6:** Customer’s purchases are influenced by store front.

**H7:** Customer’s purchases are influenced by merchandising display.

**H8:** Customer’s purchases are influenced by store layout and organization.

**H9:** Customer’s purchases are influenced by creative style & trend coordination.

**H10:** Customer’s purchases are influenced by signages/graphics.

**H11:** Customer’s purchases are influenced by store environment.

Hypothesis 5 was formed to understand the relationship between window display and consumer behavior towards purchase. Hypothesis 6 was formed to understand the significant relationship between store front and buying behavior. Hypothesis 7 was formed to understand the significant relationship between merchandising display and buying behavior. Hypothesis 8 was formed to understand the significant relationship between store layout and organization with buying behavior. Hypothesis 9 was formed to understand the significant relationship between creative style & trend coordination with buying behavior. Hypothesis 10 was formed to understand the significant relationship between signages/graphics with buying behavior. Hypothesis 11 was formed to understand the significant relationship between store environments with buying behavior.

### 4.1.3 Research Hypothesis for Electronics Category

**H12:** Customer’s purchases are influenced by window displays.

**H13:** Customer’s purchases are influenced by store front.

**H14:** Customer’s purchases are influenced by merchandising display.

**H15:** Customer’s purchases are influenced by store layout and organization.
H16: Customer’s purchases are influenced by shelf display.

H17: Customer’s purchases are influenced by floor merchandising.

H18: Customer’s purchases are influenced by wall mount display.

H19: Customer’s purchases are influenced by experience.

H20: Customer’s purchases are influenced by signages/graphics.

H21: Customer’s purchases are influenced by store environment.

Hypothesis 12 was formed to understand the relationship between window display and consumer behavior towards purchase. Hypothesis 13 was formed to understand the significant relationship between store front and buying behavior. Hypothesis 14 was formed to understand the significant relationship between merchandising display and buying behavior. Hypothesis 15 was formed to understand the significant relationship between store layout and organization with buying behavior. Hypothesis 16 was formed to understand the significant relationship between shelf displays with buying behavior. Hypothesis 17 was formed to understand the significant relationship between floor displays with buying behavior. Hypothesis 18 was formed to understand the significant relationship between wall mount with buying behavior. Hypothesis 19 was formed to understand the significant relationship between experiences with buying behavior. Hypothesis 20 was formed to understand the significant relationship between signages/graphics with buying behavior. Hypothesis 21 was formed to understand the significant relationship between store atmospheres with buying behavior.

The dependent variable of this study was consumer’s impulse buying tendency in apparel category and purchase behavior in furniture and electronics. Responses were measured using a five-point Likert scale, which ranged from never=1 to frequently=5.

The independent variables for the study are window display, in-store form/mannequin display, floor merchandising and promotional signage in apparel category. The independent variables for the study are window display, store front, merchandise display, store layout and organization, creative style and trend co-ordination, signages/graphics and store environment in furniture category. The independent variables for the study are window display, store front,
merchandise display, store layout and organization, shelf display, floor merchandising, wall mount display, signages/graphics and store environment in electronics category. These variables contain individual variables under each of them. The questions for the same were formed using a five point Likert scale, which ranged from never=1 to frequently=5. For window display there are five variable. While for in-store form/mannequin display the variables are two. For floor merchandising the variables are three and for promotional signage the variables are four.

4.2 Statistical Tools used for the Analysis

Analysis shall be done with the use of SPSS software using Factor Analysis, Correlation, Step-wise Linear Regression and Perceptual Mapping.

4.2.1 Assessing Normality

The assumption of normality is a prerequisite for many inferential statistical techniques. There are a number of different ways to explore this assumption graphically:

- Histogram, stem-and-leaf plot, boxplot, normal probability plot, detrended normal plot.

4.2.2 Factor Analysis

Factor analysis is a data reduction technique used to reduce a large number of variables to a smaller set of underlying factors that summarize the essential information contained in the variables. More frequently, factor analysis is used as an exploratory technique when the researcher wishes to summarize the structure of a set of variables. Factor analysis is performed to find out important factors from each dimension of visual merchandising.

The assumptions of factor analysis are as follows:

1. Sample size – a sample size of 100 subjects is acceptable but sample sizes of more than 200 are preferable.

2. Normality – factor analysis is robust to assumptions of normality. However, if variables are normally distributed, then the solution is improved (Child, 2006).

3. Linearity – because factor analysis is based on correlation, linearity is important. If linearity is not present, the solution may be degraded (Gorsuch, 1983).
4. Outliers among cases – factor analysis is sensitive to outlying cases. These cases need to be identified and either removed from the data set or brought into the distribution by transformation or recode options (Field, 2009).

5. Multicollinearity and singularity – this assumption is not relevant for principal component. However, in the case of principal axis factoring, singularity and multicollinearity can be identified if any of the squared multiple correlations are near or equal to 1. If this is the case, the inclusion of the offending variables needs to be reconsidered (Tabachnick & Fidell, 2007).

6. Factorability of the correlation matrix – a correlation matrix that is appropriate for factor analysis will have several sizeable correlations. Inspect the matrix for correlations in excess of 0.3 and, if none is found, reconsider the use of PAF. The anti-image correlation matrix is used to access the sampling adequacy of each variable. The measures of sampling adequacy are displayed on the diagonal of the anti-image correlation matrix. Variables with a measure of sampling accuracy that falls below the acceptable level of 0.5 should be excluded from the analysis. Bartlett’s test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy are both tests that can be used to determine the factorability of the matrix as a whole. If Bartlett’s test of sphericity is large and significant and the Kaiser-Meyer-Olkin measure is greater than .6, then factorability is assumed (Tabachnick & Fidell, 2007).

7. Outliers among variables – a variable with a low squared multiple correlation with all other variables, and low correlation with all important factors, is an outlier among the variables. These outliers may need to be deleted from the analysis (Field, 2009).

4.2.3 Correlation

Correlation looks at the relationship between two variables in a linear fashion. In this study it is used to find out relationship between purchase behavior and different dimensions of visual merchandising. With the help of correlation, it will be found that which dimension has relationship with purchase behavior of customers and which dimension does not have relationship.

The assumptions for correlation test are:
1. Related pairs – data must be collected from related pairs: that is, if you obtain a score on an X variable, there must also be a score on the Y variable from the same participant.

2. Scale of measurement – data should be interval or ratio in nature (Copper & Schindler, 2014).

3. Normality – the score for each variable should be normally distributed.

4. Linearity – the relationship between the two variables must be linear (Copper & Schindler, 2014).

5. Homoscedasticity – the variability in scores for one variable is roughly the same at all values of the other variable. That is, it is concerned with how the scores cluster uniformly about the regression line.

**4.2.4 Step-wise Regression**

Multi regression is an extension of bivariate correlation. The result of regression is an equation that represents the best prediction of a dependent variable from several independent variables. Regression is used when independent variables are correlated with one another and with the dependent variables. Independent variable can be either continuous or categorical. The dependent variable must be measured on continuous scale.

The assumptions for regression test are:

1. Ratio of cases to independent variables – the number of cases needed depends on the type of regression model to be used. For standard or hierarchical regression you should ideally have twenty times more cases than predictors, whereas even more cases are required for stepwise regression. The minimum requirement is to have at least five times more cases than independent variables (Nardi, 2005).

2. Outliers – extreme cases have considerable impact on the regression solution and should be deleted or modified to reduce their influence. Multivariate outliers can be detected using statistical methods such as Mahalanobis distance and graphical methods such as residual
scatterplots. The decision to remove outliers from the data set must be made with care because their deletion often results in the generation of further outlying cases.

3. Multicollinearity and singularity – multicollinearity refers to high correlation among the independent variables, whereas singularity occurs when perfect correlations among independent variables exist. These problems affect how you interpret any relationships between the predictors (IVs) and the dependent variables, and they can be detected by examining the correlation matrix, squared multiple correlations and tolerances. Most computer programs have default values for multicollinearity and will not admit variables those are a problem (Nardi, 2005).

4. Normality, linearity, homoscedasticity and independence of residuals – an examination of residual scatterplots allows these assumptions to be tested. It is assumed that the differences between the obtained and predicted dependent variable scores are normally distributed. Furthermore, it is assumed that the residuals have a linear relationship with the predicted dependent variable scores, and that the variance of the residuals is the same for all predicted scores. Mild deviations from linearity are not serious. Moderate to extreme deviations may lead to a serious underestimation of a relationship (Nardi, 2005).

4.2.5 Discriminant Analysis

Discriminant analysis (DA) undertakes the same task as multiple linear regressions by predicting an outcome. The assumptions of discriminant analysis are as follows:

1. Each predictor variable is normally distributed (Bian, 2013).

2. Each of the allocation of dependent variables in the initial classification is correctly classified.

3. There must be at least two groups or categories, with each case belonging to only one group so that the groups are mutually exclusive and collectively exhaustive (all cases can be placed in a group) (Bian, 2013).