Influence of Shelf Space Arrangement on Buying Behavior

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ABSTRACT

Background and purpose: In the retail industry shelf space competition are common phenomena from many decades. Shelves are organized very attractively with many offers and variety of option choices. The purpose of the study to analyze shelf space influence on consumer buying behavior in the retail store.

Methods: 171 samples were taken by using multi-stage cluster sampling and systematic random sampling from Bangladesh. Three independent variables; shelf display, shelf position and product assortment were used to measure consumer buying behavior. Regression analysis, ANOVA, Tukey HSD, K-means clustering were used to analyze data.

Findings: All the variables, shelf display, shelf position and product assortment, influence buying behavior significantly. Respondents can be divided into three cluster group in terms of their buying behavior.

Conclusion: Retailers have to provide more emphasis on shelf arrangement because consumers are highly influenced by shelf decoration, layout, and style.

1. Introduction

In the last few decades, the retailing industry is facing new challenges. As stated by Milliman (1986), the ambience of a retail outlet dictates how a customer would visualize the shopping experience in his/her mind. In addition, Kotler (1973-74) explained that the atmosphere inside a retail outlet incites explicit emotions in consumers which increases their likelihood of purchasing the good. Today, a variety of products are competing among themselves to create prominence of their own brands to the customers (Chronsell & Naucler, 2006). Shelf space allocation is frequently used strategy by the retailers to increase their profit margin by pushing consumers into impulse buying (Yang & Chen, 1999).

According to some studies, purchase decision is effectively determined by the consumers' attention in the store (Lim, Rodriguez & Zhang, 2004). In a study carried out by Dagnoli (1987), it was found that the majority of the consumers plan their purchases once they are inside the retail stores. Therefore, if the retailers can undertake effective shelf management strategy to make their products

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more visible, they may increase the profit of the specific product (Chung, Todd, Diansheng, & Harry, 2007).

In a study carried out by FMI in 2017, food retailers have said that the top two priorities of consumers when purchasing a good are – health and hygiene (82%) and personal preference for a brand (77%). These factors are valued by consumers above price and branding of the good.

It is noted that large businesses take advantage of scarce shelf space to have a competitive advantage over their rivals in the industry. However, as explained by Shaffer (2005), leading businesses not only buy shelf space to show the superiority of their products, but also because they are interested in paying more money than smaller businesses to maintain their monopoly power in the industry. So in order to earn higher profit, firms should arrange their products in an effective way as part of their shelf management strategy (Lim, Rodriguez & Zhang, 2004).

The research uses multi-stage clustering and systematic random sampling for data collection. The study has focused on three factors: Shelf Display, Shelf Position and Product Assortment. The main finding of the study is that all the factors have similar influence on purchase behavior.

2. Literature review

2.1 Shelf display

As stated by Abratt, Goodey, & Stephen and Russell in 1990, the product display in a retail store influences a consumer's impulse buying. Thus, it is important that products are arranged in a systematic order. It accounts for 25 % of the sales in the retail stores (Moorman, Mills and Paul, 1995). The display of products influences the customers' opinion of the product and their purchasing habit. The display of the products massively influences the Customer's association in the retail stores (Bitner, Barnes and Ward ,1992).

2.1.1 Discount offers

Discount offers which include price discounts and bulk discounts have a major impact on consumers' perception about a product. Price discounts increases sales growth and probability of impulse buying (Nagadeepa and others,2015).That is why retailers are inclined towards using the price discount offers for lifting up their sales and profitability (Chandon and others, 2000).

2.1.2 Point of purchase

Point of Purchase or "POP" is a promotion that is effective on consumers' buying behavior. Consumers easily get too excited   by their strong instincts stemmed at the purchasing spot. In addition, signing tends to have an effect on retail store customers. Thus, it may be concluded that consumers are more influenced when signage is combined with information of the price tag (Woodside, Chevalier and Waddle, 1975) or a display (Wilkinson, Paksoy and Mason,1982). Moreover, according a study by Patton (1981) when different products have similar   quality, consumers will buy the products which provide more information. On the other hand, when products have unequal quality, customers buy the best quality products irrespective of how eye-catching the display is.

2.1.3 Sales promotions

Sales promotions are meant to encourage consumers to buy more of a product (Wansink,Chandon and Laurent, 2000). The following research shows how sales promotions have an impact on consumers' purchasing pattern (Mihić and Kursan, 2010). Sales promotions may include gift packets, free coupons, refunds, competition and free sampling .It has been proven that sales promotional methods, with or even without other methods, improves likelihood of impulsive buying in consumers (Chandon and others, 2000; Mihić and Kursan, 2010; Nagadeepa, Pushpa and Selvi, 2015).

H1: Shelf display influences the consumers' purchase pattern.

2.2 Shelf position

In 2008, Dr. Rıfat Kamaşak found a probable correlation between positions of products on the shelf and their level of sales. The study was undertaken to assess whether product placed at different positions of the shelf, such as eye, waist or knee levels, have an impact on the sales. It was found that there was indeed a high correlation between the two variables. Notably, as the product was gradually shifted from the knee- level to the eye- level, sales volume increased when other factors remained constant. Likewise, these findings have been backed up by a study carried out by Hoch, Derez and Purk in 1994. Moreover, in 2008 Dr. Kamasak suggested that businesses should be more careful about where

they place their products on the shelf and placing them on a direct eye-level will result in a higher impact on the sales volume. However, the extent to which the businesses benefit from paying retailers large amount of money to secure the best spot on the shelf needs more consideration. In 2015, Imam, Abbas and Alvi divided the shelf into three different levels. They are - above 5 feet (over the eye-level); between 5 and 3 feet (the arms or the eye-level) and under 3 feet (under the waist-level). Likewise, 27 percent of the customers responded that the eye-level or arm-level is the most seen and accessible level for them.

H2: Shelf- position influences customers' purchase pattern.

2.3   Product assortment

Most often, categorization of the products is based on their size, which includes the length or the depth of the product. The significance of categorization decisions for both the businesses and the retailers has the highlighted in many popular journals, marketing textbooks and research articles (Jay and Kay , 2003 ; Kahn , 1999; Weitz and Levy , 2006 ; Schwartz ,2003; Lerner , 1980 ; Iyengar , 2010).

2.3.1   Increased option

The customers' perceived variation can be improved by increasing the number of SKUs as well as by supervising the shelf assigned to each product as suggested by many researches. A recent study has disclosed that decreasing the size of categorization can actually increase the purchase probability of that product. Thus, in 1998 Broniarezyk and others concluded that reduction of up to 54 percent in the low-selling stock-keeping units has no remarkable impact on the variability of consumers' perception of the product or the sales volume. Similarly, moving away less popular stock-keeping units can raise accumulated sales volume, whereas a 10 percent reduction in stock-keeping units results in a 4 percent growth in sales (Derez and others, 1994). A similar result was found from a natural experimentation carried out by Boatwright and Nunes in 2001 where reducing the categorization of the products caused a remarkable increase in the sales figure.

2.3.2   Product option (size, color, shape)

It is difficult to say how categorization of sizes will increase consumers' preferences for a particular product as increasing options of a product has both a positive and a negative effect on consumers' preferences. It is argued that consumers having a limited number of options first sum up their preferences and selects the best option, which suits their needs. As choosing from a large category of products means comparing different options with one another, the process of selecting a product becomes very complex for a customer. Thus; a consumer having no fixed ideal option in mind, finds it very difficult to choose from a large assortments of products and prefers a substitute product with a smaller assortment. On the contrary, articulate customers with an ideal option in mind finds a large assortment of a product helpful leading to higher sales for the product (Chernev, 2012).

2.3.3   Product / brand display

In 1994, Richardson, Jain and Dick stated that a brand name is usually an indication of the quality of a product and perception about the product in the consumers' minds. It also provides comprehensive details about the product itself. During 1981 Della Bitta, McGinnis and Monroe suggested that a good brand name maintains quality perceptions about a product in the consumers' minds even when the products were sold at a discount. In addition, in 1991 Dodds and others found realistic evidence suggesting the positive impact a brand name has on the quality perception of a product.

H3: There is strong correlation between product categorization and consumers' purchasing pattern.

Although consumers' purchase behavior is dependent upon many atmospheric factors in retail store (Zeynap and Nilgun 2011), many research, conducted in the past, have focused on only one or two factors. This paper specifically focuses on how shelf space management influences the buying behavior of retail stores.

3.   Conceptual framework

This is a graphic representation of a research project, which comprises the three predictors, namely - Shelf Display, Shelf Position and Product Assortment. There is one other response variable known as the Buying Behavior.

4. Research design
Sampling Techniques and Sample Size Calculation:

Multi-stage cluster sampling has been applied in this research. Initially, random sampling was used, with the help of excel sheet, to select six outlets from the popular Bangladeshi retail stores such as Agora, Shwapno and Meena Bazar. Respondents were selected from each outlet by systematic random sampling. A random number "5" was generated by excel sheet. The survey was conducted on every 5th consumer who came out from the retail outlets.

The sample size was calculated based on the following formula:

$$n = \frac{z^2 * (p) * (q)}{d^2}$$

Here,

z = 1.96 (assuming a confidence level of 95%)

As the probability of success, p, and failure, q, were unknown, the chance of any event occurring was 50%. So,

p = 50% = .50
q = 50% = .50

Figure 1.

Usually, an 'absolute' allowable error margin, d of ±5 % is considered (Arya. R, Antonisamy. B, Kumar. S, 2012). In order to reduce Type I and Type II error and with limited knowledge about the population; this study decided the minimum value of the allowable error, d, to be 15%.

So, d = 0.15 * .50 = 0.075

$$n = \frac{(1.96)^2 * (.50) * (.50)}{(0.075)^2} = 171$$

Hence, the survey was conducted on 171 respondents.

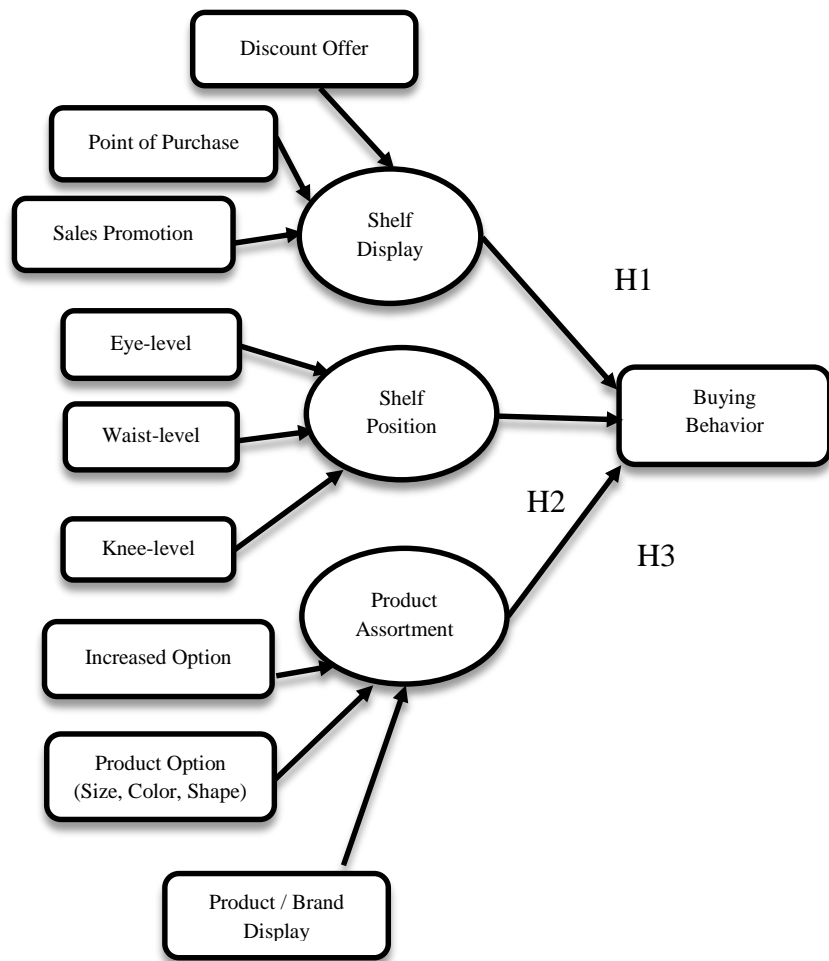## 5. Data analysis

Data were analyzed by using the RStudio version 3.5.1 SPSS version 25 software. Reliability was used to check the validity of the data and linear multiple regression to test the hypothesis. K-means clustering was used to analyze consumer group behavior.

5.1 Sample profile

The 171 respondents included 56.1% male and 43.9% female. The mode of the age group was 26-35 aged people (52.6%). It was followed by people in the age groups of 18-25 (23.4 %) and 36-45 (20.5%). The remaining 3.5% of the respondents were from the age group of 46-55. 49.7% of the respondents were graduated, followed by those having college-level education (40.4%) and 4.7% respondents had school level education. The last 5.3% of the respondents had no formal education.

The respondents represented different professions. While private employees (35.1%) was the mode in the occupation category, it was followed by businesspeople (15.2%), govt. employees (10.5%),

student (18.7%) and others (20.5%). Most of the respondents (32.2 %) belonged to the group TK 15,000 – 25,000 average monthly income. Whereas, 28.7% and 20.5% people belonged to the group of people having an average monthly income less than TK 15,000 and TK 26,000 – 35,000 respectively. The highest number of the respondents had 4-6 members (49.7%). 40.4% of them had more than 6 members in their family and the remaining 9.9% of the respondents had 1-3 members.

5.2   Reliability

Table 1.

Reliability of data

Cronbach's Alpha	N of Items
.788	9

The data were first tested for reliability using Cronbach's alpha to calculate reliability. Internal consistency (reliability) values of the measurement items were assessed before data analysis. From the reliability test, overall Cronbach's Alpha for total 9 items were found to be 0.79 which means that all the variables have an internal consistency of 79% amongst each other.

5.3   Regression analysis

Table 2.

Regression coefficient

Regression Equation, Y= α + β χ

Y= Dependent variable (Buying Behavior)

α = Intercept

β = Coefficient of the independent variable

χ = Independent variable (Factors to influence to buying behavior)

Coefficients

            Estimate Std. Error t value Pr(>|t|)

(Intercept)   0.06469   0.05126   1.262   0.209

Shelf Dispaly   0.29285   0.01341   21.841 <2e-16 ***

Shelf Position   0.34151   0.01709   19.978 <2e-16 ***

Product Assortment 0.34327   0.01281 26.792 <2e-16 ***

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.0529 on 167 degrees of freedom

Multiple R-squared: 0.9741,   Adjusted R-squared: 0.9736

F-statistic: 2091 on 3 and 167 DF, p-value: < 2.2e-16

Table 2 shows the regression results. The value of Adjusted R-square (0.97) predicts a strong relationship between them set of endogenous and the exogenous variable (Table 2). That means 97% of the buying behavior in a retail store is influenced by the factors- shelf display, shelf position and product assortment. The remaining 3% are influenced by some other factors that the study has not considered. The study has only focused on shelves management but store atmosphere, cleanliness, music, scent, temperature, lighting, color salesperson (Hussain & Ali, 2015); (Turley & Milliman, 2000), (Tinne, 2011) may also be considered for further research.

5.4   Testing hypothesis

H1 proposes that shelf display influences the consumers' purchase pattern. The regression results in table 2 supports this hypothesis (β =. 29). This means that shelf display contributes' 29% influence on consumers' purchase behavior. Therefore, shelf Display is an important variable that may contribute to a firm's sales. This result is consistent with the investigation of Display and Design Ideas (DDI) magazine in 2011, that emphasized the growing importance of planning, design and visual merchandising in a retail store. More specifically, the proper coordination among store front, store layout, window display and shelf display are found to significantly influence the purchase behavior of consumers (Mehta & Chugan).

H2 suggests that shelf- position influences customers' purchase pattern. This hypothesis is also supported by the regression result. From table 2, it has been shown that there is a very significant positive relationship between shelf position and purchase behavior (β =0. 34). This means that shelf position contributes' 34% influence to purchase behavior. This may corroborate the findings of Rashid Ali (2017)

that the position on the shelf where the product is displayed significantly influences the brand image and the customers' purchase behavior. The proposed relationship that this hypothesis deals with, also matches with a study of Dr. Rıfat Kamaşak (2008) where he observed a better sales performance for products that are situated at the eye-level rather than waist-level and knee-level shelf position.

H3 postulates large product categorization stimulates the consumer's purchase behavior. This relationship has been proved to be true. Table 2 shows a positive relationship between product assortment and purchase behavior (β =0. 34). This means product assortment has a 34% influence on purchase behavior. This has been demonstrated by some experiments that consumers may postpone their purchase if they feel unsure about whether the variety of product options available represents the full set of possible options (Greenleaf and Lehmann,1995; Karni and Schwartz, 1977). However, a large collections of product options also seems to increase the expectations of the consumers, raising their perception of the ideal product. So, it becomes more challenging for consumers to find their ideal product (Schwartz. 2002). So, retailers should increase the assortment size up to a point where it does not reach the diminishing returns.

5.5   K-means clustering

Table 3.

K-means clustering

	Cluster Centers		
	Cluster 1	Cluster 2	Cluster 3
Shelf Display (SD)	1.48107	-.38246	-.70982
Shelf Position (SP)	1.29734	-.62684	-.08351
Product Assortment(PA)	1.25340	-.97922	.60842
Number of Cases in each Cluster	43.000	83.000	45.000

From Table 3, it can be inferred that the respondents can be divided into 3 distinct clusters, based on their purchase behavior. Cluster 1 has 43 respondents who are highly influenced by shelf display, Shelf position and also product assortment. Cluster 2 is the largest cluster group, having 83 respondents. They are less influenced by shelf

display, shelf position and product assortment. Cluster 3 has 45 respondents who are highly influenced by product assortment but slightly influenced by shelf position and very less influenced by shelf display.
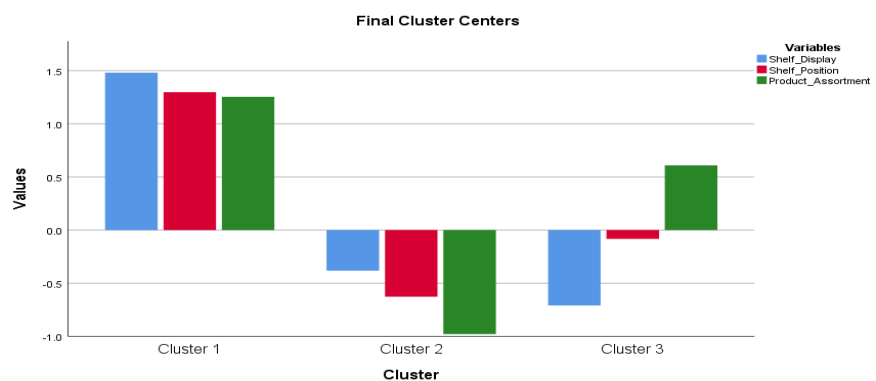
Table 4.

ANOVA (average monthly income and cluster group)

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 Df Sum Sq Mean Sq F value   Pr(>F)

QCL_1      1 33.55  33.55  24.34 1.92e-06 ***
Residuals  169 232.97   1.38
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 '' 1
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Table 5.

ANOVA (occupation and cluster group)

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          Df Sum Sq Mean Sq F value  Pr(>F)
 QCL_1      1  15.32  15.322   8.762 0.00352 **
 Residuals  169 295.53   1.749
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 Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
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Table 6.
Tukey HSD (Occupation)

(I) Cluster Number of Case	(J) Cluster Number of Case	Mean Difference (I-J)	Std. Error	Sig.
Cluster 1	Cluster 2	-1.13922*	.23558	.000
	Cluster 3	-.57075*	.23910	.047
Cluster 2	Cluster 1	1.13922*	.23558	.000
	Cluster 3	.56848	.27138	.094
Cluster 3	Cluster 1	.57075*	.23910	.047
	Cluster 2	-.56848	.27138	.094

Table 7.
Tukey HSD (average monthly income)

(I) Cluster Number of Case	(J) Cluster Number of Case	Mean Difference (I-J)	Std. Error	Sig.
Cluster 1	Cluster 2	.24605	.21646	.493
	Cluster 3	1.13029*	.21970	.000
Cluster 2	Cluster 1	-.24605	.21646	.493
	Cluster 3	.88424*	.24936	.001
Cluster 3	Cluster 1	-1.13029*	.21970	.000
	Cluster 2	-.88424*	.24936	.001

Clusters are significantly different between groups and within groups in case of occupation (F value 8.76). From table 6, it can be inferred that in case of occupation, cluster 2 and cluster 3 have no significant difference on the mean. However, cluster 1 has significant mean differences with cluster 2 and cluster 3. Clusters are significantly different between groups and within groups in case of average monthly income (F value 24.34). From table 7, it can be inferred that in case of income, cluster 1 and cluster 2 have no significant difference on the mean. Whereas, cluster 3 who are highly motivated by product assortment, has significant mean differences with cluster 1 and cluster 2.

6. Managerial Implications

This research may help retail store managers and owners in designing the interiors of their stores. They may take decision regarding their shelf displays such as discount offer, the point of purchase, sales promotions etc. They may also decide the levels at which to place the products (Eye-level, waist-level, knee-level) as well as the product options (product assortments) as all of these have been found to influence the buying behavior. Furthermore, from the clustering of customers, it was observed that more than 50 % of them are influenced by product assortments. Therefore, the store managers should give more emphasis on this variable.

7. Limitation and future research

This paper may have certain limitations. This study has been conducted on only 171 respondents due to limited resources. The precision of the result could have been increased if a larger sample had been taken. Secondly, the survey was undertaken on customers who had just came out from the retail store. The research would have been better if it was carried out on the respondents at a prescheduled time. The research results could have been improved if the survey was conducted from a larger number of outlets. These issues may be addressed in future research.

Apart from shelf space management, future research could also focus on the influence of other factors such as store atmosphere, scent, temperature, lighting, color, music, salespeople, cleanliness and so on (Hussain & Ali, 2015); (Turley & Milliman, 2000), (Tinne, 2011) may be considered for further research.

8.   Recommendation and conclusion

In the last decade, the retail sector in Bangladesh has experienced tremendous growth. Youths prefer retail stores that have well planned layouts. Retail stores must undertake in-depth studies in understanding both psychographic and demographic profile of consumer groups to influence their buying attitude. Therefore, retail owners must be able to understand how retail customers may respond to the promotion, product features, or prices of products offer. In addition, the retailers should give careful attention to shelf display, shelf position and product assortment.

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